DOCUMENT RESUME

ED 084 737 EC 060 531

TITLE	Methods and Materials in the Education of the Visually Handicapped.
INSTITUTION	Association for Education of the Visually Handicapped, Philadelphia, Pa.
PUB DATE	Jun 72
NOTE	116p.; Selected Papers presented at the Biennial Conference of the Association for the Education of the Visually Handicapped (51st, Miami Beach, Florida, June 25 through 29, 1972)
AVAILABLE FROM	Association for Education of the Visually Handicapped, 1605 Spruce Street, Philadelphia, Pennsylvania 19103
EDRS PRICE	MF-$0.65 HC-$6.58
DESCRIPTORS	*Conference Reports; *Deaf Blind; *Exceptional Child Education; *Instructional Materials; Language Skills; Multiply Handicapped; Sensory Aids; Vision; *Visually Handicapped; Vocational Rehabilitation

ABSTRACT

Presented are 19 selected papers given at the 1972 conference. The following titles are included: "Multi-Handicapped, the King of Challengers"; "Is Listening the Answer?"; "An Aural Study System designed for the Visually Handicapped"; "VOCOM I--Speech Compressor Expander"; "A Comparison of the Effectiveness of Standard Print and Large Print in Facilitating the Reading Skills of Visually Impaired students"; "Demonstration of the Peabody Language Development Kit Level #p"; "Toys for Tots"; "Educational Materials for Early Childhood Education"; "Movement Exploration and Gymnastics for Visually Handicapped Children"; "Federal Programs and Their Implications for the Visually Handicapped"; "A Delivery of Comprehensive Services to Deaf-Blind Children and Their Families Through the Regional Structure"; "Diagnostic Services and Programing for Deaf-Blind Children"; "Developing a Vocational Program in a Residential School for the Blind"; "Give a Man a Fish and He Can Eat for a Day--Teach Him How to Fish and He Can Eat for the Rest of His Days"; "Guidance, For Whom? For What? By Whom? How?"; "Low Vision Training-Implications for Teacher Preparation and Professional Development"; "Development of Visual Potential in Young Children"; "The Need for Curriculum Planning in the Field of Low Vision"; and "Educationally Significant Visual Assessment in Young Children". (DB)

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ASSOCIATION FOR EDUCATION OF THE VISUALLY HANDICAPPED

Fifty-First Biennial Conference

June 1972
Miami Beach, Florida

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METHODS AND MATERIALS IN THE EDUCATION OF THE VISUALLY HANDICAPPED

Association for Education of the Visually Handicapped
1604 Spruce Street
Philadelphia, Pa. 19103

ASSOCIATION FOR EDUCATION OF THE VISUALLY HANDICAPPED

Known first as the Instructors of the Blind, and later incorporated as the American Association of Instructors of the Blind, AEVH began in 1853 with a national meeting of superintendents of sixteen residential schools for the blind. Except for a few years when national emergencies prevented, conventions have been held biennially since that time. At the 1968 convention, the name of the organization was changed to Association for Education of the Visually Handicapped.

In 1952 the Workshop method of national conferences was adopted and membership was broadened to include all who were interested in improving the educational opportunities of visually handicapped children. In the Workshops, educators are able to define problems and work actively toward their solutions. Under the leadership of their own elected officers, workshops may continue in common efforts between national conventions, often producing newsletters or taking action at regional meetings. Student chapters have now been formed at several universities and several state chapters are functioning very effectively. In the planning for the next biennium is a program for regionalization which will provide regional meetings within reach of our members all over United States and Canada.

AEVH publishes a newsletter called the FOUNTAINHEAD, a volume of selected papers from its biennial conference, and provides the professional journal, EDUCATION OF THE VISUALLY HANDICAPPED, for its members. The organization also participates actively in teacher and houseparent certification, training institutes, the development of special standards, the encouragement and report of research in the field, and cooperation with national and international agencies and organizations interested in the education of visually handicapped children and youth. The popular AEVH brochure on education of the visually handicapped as a career is annually sent to many guidance counselors and young people who seek information relevant to their own choice of a profession.

AEVH is affiliated with The Council for Exceptional Children, a Department of the National Education Association.

For further information, write AEVH Executive Secretary, 1604 Spruce Street, Philadelphia, Pennsylvania 19103.

MEETINGS

The following is a list of the conventions of the American Instructors of the Blind (1853-1871), the American Association of Instructors of the Blind (1872-1968), and the Association for Education of the Visually Handicapped (1968-1972):

1st Meeting:	August 16-18, 1853, at New York, New York
2nd Meeting:	August 8-10, 1871, at Indianapolis, Indiana
3rd Meeting:	August 20-22, 1872, at Boston, Massachusetts
*4th Meeting:	August 18-20, 1874, at Batavia, New York
5th Meeting:	August 15-17, 1876, at Philadelphia, Pennsylvania
6th Meeting:	August 21-23, 1878, at Columbus, Ohio
7th Meeting:	August 17-19, 1880, at Louisville, Kentucky
8th Meeting:	August 15-17, 1882, at Janesville, Wisconsin
9th Meeting:	August 19-21, 1884, at St. Louis, Missouri
10th Meeting:	July 6-8, 1886, at New York, New York
11th Meeting:	July 10-12, 1888, at Baltimore, Maryland
12th Meeting:	July 15-17, 1890, at Jacksonville, Illinois
13th Meeting:	July 5-7, 1892, at Brantford, Ontario, Canada
14th Meeting:	July 17-19, 1894, at Chautauqua, New York
15th Meeting:	July 14-16, 1896, at Pittsburgh, Pennsylvania
*16th Meeting:	July 12-14, 1898, at Lansing, Michigan
17th Meeting:	July 9-11, 1902, at Raleigh, North Carolina
*18th Meeting:	July 20-22, 1904, at St. Louis, Missouri
19th Meeting:	August 21-23, 1906, at Portland, Oregon, at Salem, Oregon, and at Vancouver, Washington
20th Meeting:	July 14-16, 1908, at Indianapolis, Indiana
21st Meeting:	June 28-July 1, 1910, at Little Rock, Arkansas
22nd Meeting:	June 25-28, 1912, at Pittsburgh, Pennsylvania
23rd Meeting:	June 28-30, 1915, at Berkeley, California
24th Meeting:	June 4-7, 1916, at Halifax, Nova Scotia, Canada
25th Meeting:	June 24-28, 1918, at Colorado Springs, Colorado
26th Meeting:	June 21-25, 1920, at Overlea, Maryland
27th Meeting:	June 27-30, 1922, at Austin, Texas
*28th Meeting:	June 23-27, 1924, at Watertown, Massachusetts
*29th Meeting:	June 21-25, 1926, at Nashville, Tennessee
*30th Meeting:	June 25-29, 1928, at Faribault, Minnesota

*31st Meeting:	June 23-27, 1930, at Vancouver, Washington
*32nd Meeting:	June 27-July 1, 1932, at New York, New York
*33rd Meeting:	June 25-28, 1934, at St. Louis, Missouri
34th Meeting:	June 22-25, 1936, at Raleigh, North Carolina
*35th Meeting:	June 27-30, 1938, at Lansing, Michigan
*36th Meeting:	June 24-28, 1940, at Pittsburgh, Pennsylvania
*37th Meeting:	June 26-30, 1944, at Little Rock, Arkansas
38th Meeting:	June 24-28, 1946, at Watertown, Massachusetts
*39th Meeting:	June 21-25, 1948, at Austin, Texas
*40th Meeting:	June 26-30, 1950, at Philadelphia, Pennsylvania
*41st Meeting:	June 29-July 3, 1952, at Louisville, Kentucky
42nd Meeting:	June 27-July 1, 1954, at Batavia, New York
43rd Meeting:	June 24-28, 1957, at Worthington, Columbus, Ohio
44th Meeting:	June 22-26, 1958, at Vancouver, Washington
*45th Meeting:	June 26-30, 1960, at Donelson, Tennessee
*46th Meeting:	June 28-July 2, 1962, at Miami Beach, Florida
*47th Meeting:	June 21-25, 1964, at Watertown, Massachusetts
*48th Meeting:	June 26-30, 1966, at Salt Lake City, Utah
*49th Meeting:	June 23-27, 1968, at Toronto, Ontario, Canada
*50th Meeting:	June 28-July 2, 1970, at New Orleans, Louisiana
*51st Meeting:	June 25-29, 1972, at Miami Beach, Florida

*Copies of convention proceedings or selected papers for these meetings may be purchased by writing to the Association for Education of the Visually Handicapped, 1604 Spruce Street, Philadelphia, Pennsylvania 19103. Copies of the Indexes for 1922-1930, 1931, 1932-1940, and 1944-1960 are also still available.

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MULTI-HANDICAPPED: THE KING OF CHALLENGERS

Verna Hart, Assistant Professor

George Peabody College for Teachers
Nashville, Tennessee

"I just don't know what to do with Johnny," says a teacher. "I don't know what to do with 'that' class," exclaims a principal. "What will we do with all of these children?" questions a superintendent. And "We don't want *those* kinds of kids in *our* school," comes from the alumnae.

All of these questions are referring to the growing numbers of multi-handicapped children. *What* to do with them, *how* to educate them, *who* should teach them, and *where* they should be directed in terms of potential employment are of concern to all of us working with blind children with multiple problems.

Rather than waiting for the answers, there are things that each of us can be doing now to bring closer the day when we will have better information on what to do. First, no pupil should be viewed as hopeless. Many stories could be told about children who have been excluded from programs because they were too low functioning and who, with intensive work, have been able to perform in regular classrooms with sighted children. At the present time there are no tests, no diagnostic instruments, and no special criteria which can be used to determine future success or failure of a child in a program. Because of this it is important to give *all* children the opportunity to learn. This should not be a brief trial period, but a period long enough to program them in many areas.

Second, we have to stop trying to make the children fit the molds and begin making molds to fit the children. Too often we talk of individualizing instruction and then act as if individualization means having individuals conform to our preconceived standards. Reading, writing, and arithmetic have become our Trinity. Failure to have a child succeed in these areas, whether in Braille or print, becomes a personal reflection on us as teachers. Recent court

decisions have stated that *all* children, no matter how retarded or how disturbed, have the right to education and treatment. The fact that we must provide for them means we must think in new terms of educational models. Allowances are made for the cerebral palsied child who has so much brain damage he is unable to coordinate his hands to read Braille, or his eyes to read print. At the same time, however, we fail to make allowances for the child who may have extensive damage to the brain in the language area and thus be unable to make sense of dots or letters. We must accept the fact that some children will not become readers, or writers, or be able to figure complex sets of numbers. There should be no stigma attached to these children, either in our eyes or in theirs. Each child must be valued for his uniqueness, not his conformity.

The latest data gathered about our visually handicapped youngsters show an increasing use of listening skills for those unable to read. We must accept the fact that we have to work as hard at developing listeners as we do in developing readers. Babies are not born able to distinguish sounds and their meanings. Too often parents of visually limited children are not aware of the need to develop such discrimination, and their children arrive at school with no more listening ability than a young infant. In many homes the constant blare of the TV deadens meaningful sounds, and the children, to protect their own ability to function, learn to tune out sounds. Thus useful sounds also become tuned out. We must teach the children to attend to sounds, to ascertain which are meaningful, to delegate others to the background, and to orient themselves to those which can aid them in their surroundings.

How realistic are we in our programming for multi-handicapped children? Often these children receive a watered-down curriculum from what their visually handicapped schoolmates receive. Such a watered-down curriculum puts them even farther behind academically, for these children start out behind the others and need *more*, not less, to compete successfully.

Every subject, every lesson plan should be geared to one thought. "Why am I teaching this? Will what I am teaching today make a difference in the child's ability to function independently when he leaves school?" Are we busy teaching the products of South America to a child who is unable to care for his own needs independently? Are we busy teaching mathematical concepts to young adults who don't yet know the value of money or the amount it takes to provide their basic necessities?

Recent studies are presenting more and more evidence that we are willing to tolerate the differences of those with abnormal behavior or appearance if they are pleasant, likable people. Perhaps our number one task should be to make our children nice people to know. Assigned as a teacher to a residential school's family style dinner table, I watched as one teen-aged multi-handicapped girl used her hand as a pusher for her mashed potatoes and gravy. She filled her spoon, held baby-fashioned in her other hand and wolfed down the food. She put her spoon down to pass a dish of food to me. As I received the dish, thoroughly messy with mashed potatoes and gravy, I commented on the use of her hand as a pusher and on her use of the spoon as well as the manner in which she held it. In disbelief she argued that there was nothing wrong with the way she was eating, because someone would have told her if there was. It is often such seemingly unimportant things that keep our children from being accepted and acceptable.

Surveys show that contacts with handicapped children increase others' acceptance of them. Let's make sure that the contacts are positive ones that show what visually handicapped youngsters can do instead of what they cannot do.

Dr. Ed Martin, in the March 1972 issue of *Exceptional Children* gave some interesting figures regarding our children who will be leaving school in the next four years. He stated only 21% will be fully employed or go on to college. Forty percent will be underemployed and 26% unemployed. Ten percent will be in sheltered settings and 3% totally dependent. I'm sure our rate of employment for multi-handicapped blind students will be even poorer than this. If we are to be successful in our educational efforts, the figures for employment must increase.

So often stress is placed on teachers to have pupils perform academically that all efforts are placed in this direction. Will such efforts result in a better employment record for the students?

Rather than a watered-down curriculum, let's think about new directions for our multi-handicapped. Academic skills should be stressed as tool subjects only, with scholastic aspects receiving emphasis only if it will make a difference in the student's functioning level when he leaves school. Communication skills should be emphasized, not on reading and writing per se, but on whether the student can receive instructions, understand them, and carry them out. Can he process what we are saying enough to ask questions concerning what he does not understand? Has he been taught to *think* or to spout

back information that has no meaning? Can he carry on a social conversation? The ability to communicate is of *vital* concern. However, a child may become too verbose and lose meaningful communication. Has he been meaningfully taught some of the cues that he should be getting from his listeners if he is too verbal? Has he had experiences to talk about? Often our multi-handicapped children have had even less experience than their visually handicapped peers. If any of us have been hospitalized or isolated for a period of time, we notice how quickly our conversation deteriorates. Any young mother tied to a home by many small children quickly reflects her environment. Is it any wonder that our children who have had so few experiences have little to talk about?

Experience alone will not lead to communication. Carefully laid plans with specific behavioral objectives must be made before the experiences, and well thought out carry-over must be completed after each experience, no matter how insignificant the actual experience. If it was worth having, it is worth following through.

Major emphasis needs to be placed in any curriculum on interpreting relationships. Our children need to be made sensitive to the reactions and needs of others. Overprotected children become the center of their own universe, with all things coming to them and with no need to reach out and share with others. To perpetuate such activities in the school setting does a grave injustice to the children. They must learn early that life is both a give and take situation. Analyzing another's feelings is important, and the fact that children have multiple problems does not mean they are incapable of determining other's feelings or that they lack them themselves. Many behavior problems are caused by the inability of teachers, counselors or houseparents to interpret the relationships they have with the student and vice versa. Students must recognize that any situation between two people can create problems and they should be taught techniques for avoiding conflicts as well as resolving them.

Self-care skills are extremely important in a student's ability eventually to become independent. Not only should they be able to dress, toilet, bathe and care for all their personal needs, but they should be aware of basic health care. Dirty fingernails are not only offensive to many of those who observe them, they are also a source of bacteria and infection. Both health and social aspects should be stressed. Parents and houseparents should not be expected to do this alone; each person working with the student must be aware of particular problems the student presents and ways in which they can be remediated. Open discussions are necessary. Letters

to Ann Landers should never have to be written about our students if we do our jobs well.

Self-care skills should also include basic social graces that those with vision can learn incidentally. Our visually handicapped must be specifically taught and if pupils come to us lacking such graces, we should be the ones to teach them. We should not become guilty by default if a child does not know he may be offending someone by poking his fingers into his eyes, rocking, wiping his nose on the back of his sleeve, or publicly masturbating.

Self-care skills should include those that pertain to the child's functioning safely within his environment. Such safety habits include good mobility skills. Teachers often ask me if I feel mobility should be taught to their multi-handicapped pupils. The answer is an emphatic *yes*! The multi-handicapped children are often less able to take advantage of clues from the environment and so need *more* orientation and mobility training. This alone can often make them more acceptable and able to function within their environment. Economically, mobility makes a dollar and cents difference. Those who have good mobility are better able to find jobs and to keep them. If able to move around and function well within their settings, they are more accepted and less stigmatized as "different." Mobility skills should not be confined to specific class periods. Each day, from the time he arises until he retires, the child is practicing mobility skills.

Development of good work habits and attitudes toward work needs to be built into the curriculum. Employers will often put up with less production if a worker is thorough, punctual, and reliable. These qualities are not developed at age sixteen but should be started at age six or even before the child enters school. Many of our students fail to succeed in a job placement because of poor attitudes or work habits and not because of inability to carry out the work. Somewhere, these habits must be taught, for they do not suddenly appear when a teen-ager appears for his first job.

Many of our multi-handicapped students will not be able to function in other than a sheltered environment. We need to throw out some of our preconceived ideas about what must transpire within such a setting. Keeping "good workers" in a sheltered setting when they could be functioning in a regular position is often justified in terms of "they're more comfortable there" or "our production would go way down--they're our best workers." Keeping such workers does them an injustice, however, for they fail to learn to become com-

fortable with their seeing peers, and retaining them keeps the multi-handicapped from a chance at sheltered work experience. Sheltered experiences should be for those who need them, and, hopefully, should be a stepping stone to more gainful employment. Such sheltered work experiences should be as innovative as possible. New technical advances are constantly being made in industry and counselors and directors of workshops should be aware of contract jobs open. Such jobs can be begun in a sheltered setting and then transferred when the workers are ready.

Use of leisure time should also be taught. Nowhere in our curriculum do we discuss how much beer one might consume without becoming drunk. Realistically, however, this is a problem that presents itself when the fellows drop into the corner bar on the way home from work. If we are to prepare our students for the "real world," smoking, drinking, drugs, and sex must all be discussed realistically and candidly. The use of leisure time involves more than sticking an earpiece into the ear and turning on a transistor radio.

We must be mindful not only of *what* we teach but of *how* we teach it. The issue of accountability is with us. It's important to think of the functional aspects of what and how we teach but we must also be professionally concerned with our contractual obligation. Do we earn our salary each day that we report for work? Do our children learn enough relevant information each day to warrant our paycheck?

At the same time that the courts are telling us that all children must be taught, we are expected to be accountable for what we teach them, how we treat them and for the total outlay of money spent in relation to effort expended. At no time in our history have those working with handicapped children had more pressure exerted upon them.

Efforts to educate and treat more handicapped children are being expanded while we at the same time are constantly refining the information garnering process pertinent to these children. While the storage of facts increases, court decisions have opened these records for inspection to parents of the children we serve. Problems with confidentiality of records have become an issue.

Multi-handicapped students have more problems than normal children and their files tend to be more voluminous. We, as the personnel involved with these students, need better information on how to keep records, and what to put into them. The danger of computer banks, the masses of intelligence and achievement testing results,

and the availability of psychologists, counselors, and others to our population makes information especially vulnerable to breaches in confidentiality. We are liable for such breaches at the same time that we seek the right of privileged information. All of us must learn to live with the threat of lawsuits as we work with our multi-handicapped population.

Thus far I've talked pretty generally in terms of what the children need and very little about how to work with them. Basically, there are a few simple concepts that should be kept in mind by all those working with the child. The mental age of an I.Q. score is a much better indicator of where to begin than the chronological age. If a child is 12 with an I.Q. of 75, he will not be functioning as a twelve year old. His mental age will be that of an eight year old and his abilities will probably be around those of an eight year old. His language will probably closely correlate with his mental age, too. This, then, becomes the starting point. Why frustrate the child and yourself by beginning at a level where you will both fail? The mental age, then, gives a rough estimate of the level of functioning. Begin basic planning there and revise it as the need arises.

A good knowledge of child development is the best aid all can have in building a curriculum. Knowing the ages at which a child can recognize shapes, colors, and think abstractly will help in building a sequential program.

A knowledge of task analysis is also needed. Each task presented to the children must be examined in terms of what goes into the activity. Often children fail, not because the activity was too high level, but because too big a step was given at a time. We often try to get children to skip before they can hop. Analyzing a skip shows that it's a double hop. Such analysis can be carried out in the school and after school activities. A child may not be able to subtract because he lacks basic number combinations. He may be able to do rote counting but not learn money because he has never learned one-to-one correspondence. By breaking down the tasks and analyzing them in terms of the learning problems the children present, we can prevent many difficulties and can help the children gain real success. A knowledge of *what* to present through child development and *how* to present it through task analysis gives us almost unlimited background for working with the students. Coupled with the idea of only teaching relevant things, teaching multi-handicapped children can be a very rewarding experience.

Often classes for multi-handicapped have been given to teachers who have not succeeded with regular classes. The children are isolated and given no special services. Nothing can do more to jeopardize a program than putting a poor teacher with children who have severe learning problems. The more severe the problems, the better the teacher must be to meet these problems and the more help she will need to work with them. These children do not learn by themselves or merely through exposure. They must be taught and their needs demand the best resources in the building. No one technique will be successful with all children. The best teachers are needed and workers must learn to use the "W-W Approach" - whatever works - and be prepared to defend it. "Nothing succeeds like success." And after success with the multi-handicapped, those who have been associated with them will agree that working with more minimally handicapped children no longer seems a challenge.

IS LISTENING THE ANSWER?

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Development of Effective Listening Skills

Listening skills are developmental in nature. Everyone associated with the learning environment, whether it be in the home, the school, or the dormitory, is in a position to influence the child's ultimate level of listening performance. The degree of influence will be highly related to the types of behavior that are encouraged. Too often we have not specified for the student how he can maximize his chances to learn, nor have we provided structured opportunities for him to develop positive listening habits. I'm referring now to learning specific study skills for listening. It has been consistently demonstrated that in adopting specific study techniques, learning effectiveness has been increased (Kranyik & Shankman, 1963; Morgan & Deese, 1969; Robinson, 1961). We need to consider very carefully how study skills and techniques generally associated with study by reading can find application in the aural learning experiences we provide.

It is my purpose to specify some approaches that can be used by the teacher and the student to increase the chances of effective listening and subsequent learning. For purposes of the discussion the term teacher refers to any individual having control over the arrangement of the listening experience.

Opportunities to Practice Listening

Consider for a few moments what the teacher can do to encourage effective listening skills. First, we need to provide a variety of taped or recorded material. The materials should reflect an informational input from a wide variety of content areas. Social studies, literature, and science should be presented as well as

special areas such as poetry and foreign languages. Reference material in the form of a dictionary and encyclopedia are currently being developed. To take advantage of the recorded materials already available you should be familiar with the catalog of materials available. The Talking Book program and Recorded Educational Aids to Learning are two available through the American Printing House for the Blind. There are many commercially available cassette recordings which focus on the development of listening skills. The Educational Developmental Laboratories has a series with primary levels especially adapted for use with visually handicapped students. There is a publication currently available and one in preparation which list other firms producing recorded instructional materials (Leach, 1970). Excellent recorded textbook materials at the high school and college level are produced through Recording for the Blind.

It is quite important that the content of the material be appropriate and meaningful to the student. For this reason the teacher must also be ready to prepare tapes for listening. The individual needs and abilities of the students should provide the structure and format for the recording. The increased availability of compressed speech tapes will provide further opportunities to emphasize listening as an effective learning medium.

Providing opportunities for listening is an integral part of the familiarization process; however, listening skill development will not be an automatic outcome. There are other things the teacher must do to complement the opportunities for practice. This brings us to the second major way we can influence the development of listening skills.

Interaction with the Message

The students must be encouraged to interact with the message. We promote such interaction when we pause in our teaching to ask questions of the class. Hopefully, some of the students will even be anticipating what the questions might be. We are all familiar with the many techniques they use when they try to anticipate questions for a test. In the final analysis the student must ask questions of the materials, so this level of student involvement is highly desirable. It's another instance of developing independence, independent study skills.

Asking questions of the material assists the student to focus on his purpose for listening and to organize the information received

around that purpose. Here are some questions the teacher can ask and encourage the students to ask about what they hear. Ask your students:

(1) What was the main idea? It's essential to identify the main ideas presented. Without this step, meaning may be vague and recall will be adversely affected. The message may use a list of facts to support a main idea and the student must learn to distinguish between the main idea and the facts that support it.

(2) What was the nature of the selection? Was it funny, sad, exciting, or perhaps controversial? The emotional involvement of the listener may certainly affect comprehension.

(3) Did parts of the selection provide a word picture? At this point it should be recalled that the teacher should exert some control over the selections being used to develop listening skills. Especially with younger blind children, some selections will be more descriptive than others and meaningfulness will be directly related to the range and variety of their prior experiences.

You may also ask, "What part of the selection provided a summary or conclusions?" If you are listening to obtain an overview or the general organization, this may be the level at which you want them to work. Ask, "Were there cue words which alerted you to important parts?" For example, the student should be quickly alerted to words and phrases such as "in conclusion," "the main idea is," or "remember." A statement may also be repeated in a slightly different way. When there is a repetition it should give the listener a clue as to its possible importance. A change in voice, intonation, or emphasis or even a pause may signal an important detail or point. These are clues which the knowledgeable listener will use to advantage.

Another question should relate to the sequence of events. The ability to sequence is an important listening skill especially for blind children. In addition to asking for recall of a sequence, you can provide informal exercises in following a sequence of directions. With practice, a series of oral directions may be increased in number and complexity to further the development of mobility skills.

A final question may ask, "What generalizations were made?" A useful hint is to encourage the students to listen for illustrations, examples, or lengthy explanations, all of which the author

may be using to develop a generalization.

These questions may be posed by you, the teacher, or by the students as they gain experience with the listening task. It's important to let the students know there will be questions and generally to expect a certain number. The format for questions should be flexible. There is a need for oral questions prior, during, and following a listening session. Written study questions can also play a part as they require students to attend for specific facts. The teacher may also monitor the learning experience of the group in other ways. For example, you can use non-verbal responses to evaluate the students' progress. Have the students raise their hands at appropriate times. When working with a small group you may direct them to "raise your hand when you hear a main idea" or "raise your hand when you hear a summary statement or a clue word." This approach will allow you to follow-up on inaccuracies or misinterpretations which may be evident. It will certainly increase attending behavior which is so important for listening effectiveness. Mention should be made of the teacher's attitude toward listening and aural learning. Expect your students to listen. Get into the habit of giving directions only once. It is realistic to expect that with practice our students will be ready and able to listen the first time with higher degrees of accuracy.

In discussing the questions that should be asked of the students, reference has been made to the importance of listening with a purpose in mind. Once the student recognizes the purpose for listening he can select the type of questions to ask and assume some responsibility for how he listens, whether distributing the listening over time or re-listening more than once. If the purpose for listening is to gain information he may listen for main ideas or summary statements. He can generalize from the information given and compare statements with his own past experiences. His questions may focus on the what, where, or when type. For general information probably one listening will be sufficient.

If the purpose for listening is to attain a high level of comprehension, he must make an interpretation of what he hears and his questions will be of the why and how type. It is a good approach to have the student put the message into his own words. You may want to initiate this process by asking the student, "What do you think about the message content?" The ease with which he is able to organize the material will largely determine whether re-listening is necessary.

Independent Listening Behavior

There is a third way in which you can influence aural learning, but it is perhaps the most difficult of all. The student must assume responsibility for active listening. You are in the ideal position to assist the student to reach this goal.

(1) The student must become aware of the message format. If he is listening to a textbook he needs to know if it has an introduction or preface section, if it has a summary, study questions, or topic headings. He should want to know if italicized words are defined in the text or if there is a glossary included. In addition to knowing the format, it is especially critical that he know how these parts may be used to full advantage. Introductory segments, study questions, and topic headings are all useful in obtaining an overview and structuring the content for organization. Perhaps it goes without saying that when the meaning of key words is unknown, listening will not be effective. In the event some of these parts are not included, special arrangements may be made to tape a list of topic headings or to write out the table of contents. Techniques to develop an adequate vocabulary should be encouraged. New words may be defined based on the context of the message, but further use of a dictionary is highly recommended along with the general development of spelling skills. Graphics in recorded form present many problems for the listener and whenever possible a written interpretation should be provided.

(2) The student must use recording devices with ease. Complete familiarity with the equipment is essential. There are many individuals with their own personal systems for the retrieval of recorded notes and information. Time limitations do not permit a discussion of these approaches, but the problems of retrieval have been recognized. A system is needed for indexing tapes, both as to the kind and placement of audible signals. Labeling and storage for cassettes may not be as pressing a problem but some system is required.

(3) At the present time many students are using the variable speed capability with good effect. In the near future when compressed speech capabilities are more readily available, it will become even easier to skim or scan the material.

(4) A frame of reference may also be obtained when using a personal reader. Let the reader know the types of information you are interested in obtaining. In keeping with this approach, it is

imperative that the student know the types of information that will be most useful to him.

Listing the topic headings, usually represented in bold face type, quite often provides a basic outline for organizing the material and taking notes.

At this point let me outline what I feel are the basic steps for active listening. The student should be *alert* to the message. First, the listener should anticipate the message, by this I mean to obtain a frame of reference or the sequence of ideas that will be developed.

Second, the student should listen, listen with a purpose in mind--listening for general or specific facts, for general comprehension and understanding.

Third, the listener should evaluate the message in terms of this purpose. He should make an interpretation and generalize to information already available to him.

Fourth, there should be provision for review. It seems highly probable that he will take notes which will represent his organization. Note-taking is highly desirable since it increases attentiveness, prevents side-tracking, and acts to promote further review and ultimate understanding. The final step is to test oneself informally in preparation for a formal test that should always be expected.

An attempt has been made to offer several specific suggestions regarding the teacher's role in facilitating the development of listening skills. For purposes of review they were:

(1) To provide a variety of opportunities for listening.

(2) To ask questions of the material and encourage the students to ask questions.

(3) To specify the purposes for listening, to provide techniques which will alert the student to clues in the message.

(4) To provide suggestions for using recordings more effectively, procedures for retrieval of information, and complementary note-taking skills.

In summary let me say listening is just one method visually handicapped students have of gaining information. Our major concern should be how that information is used in the learning situation. If you are asked, "Is listening the answer?" consider how listening can be used to develop independent study skills and answer in the affirmative.

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AN AURAL STUDY SYSTEM DESIGNED FOR THE VISUALLY HANDICAPPED

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The Aural Study System designed and built at the American Printing House for the Blind (APH) did not just evolve, but rather was the product of several years of systematic study into the processes and procedures involved in aural learning by the blind. The impetus for such research was the oft noted slow reading rates for those who read by braille. Information on these has been concisely summarized by Nolan and Kederis (1969) where it is abundantly apparent that braille, at best, is a poor means of communication.

At the beginning of the sixth decade of this century, personnel in APH's Department of Educational Research became concerned over the slow reading rates of the blind and became interested in the academic utilization of listening as a possible means of alleviating the problem. Search of the literature revealed that, at that time, only one study (Lowenfeld, 1945) was reported where learning through reading and listening had been compared for a blind population. Results of this study showed listening to be the superior mode of communication under a number of circumstances and the faster mode under all circumstances.

The first listening study conducted by APH was done in collaboration with the University of Louisville (Bixler, Foulke, Amster & Nolan, 1961) and concerned comprehension of rapid speech by the blind. Results indicated that, within limits, this approach would be feasible. However, at this point it became evident that, because of the dearth of information concerning aural learning by the blind, the scope of the research effort needed to be extended beyond mere use of compressed or speeded speech.

Shortly thereafter, APH conducted a pilot study (Nolan, 1963) of the relative learning achieved through reading and listening by

blind children. Results of this study revealed "no significant differences between listening and reading, amounts of practice or their interaction. ... listening time was about one-third that for reading [p. 315]." These results were a valuable addition to those reported by Lowenfeld (1945) as they were obtained from subjects reading the now commonly used braille grade two whereas Lowenfeld's subjects had read the then commonly used braille grade one and braille grade one and a half. Following the encouraging results of Nolan's pilot study, APH obtained a grant from the Institute of Neurological Diseases and Blindness of the National Institute of Health to study in greater depth reading and listening in learning by the blind. The studies conducted in this series were reported by Nolan (1966, 1968). They provide uncontestable evidence that listening is the superior mode for learning a variety of subject areas, in terms of efficiency, for both elementary (grades 4-6) and high school level students regardless of whether they read by braille or large type (Morris, 1966). Another finding of interest resulting from these studies was that of reading rate for the three types of text material used; namely, literature, science, and social studies. Using materials appropriate in reading difficulty for the grade level of their users, it was found that the average reading rate for the three types of material for elementary students in grades 4-6 ranged from 50 to 60 words per minute for readers of braille and from 69 to 74 words per minute for legally blind readers of large type. Braille reading high school students' reading rates ranged from 65 to 74 words per minute while their large type reading counterparts read at rates ranging from 80 to 86 words per minute. These rates were determined from passages of approximately 2100 words and are considered realistic for study type material. The figures empirically substantiate the fact that the reading deficit, in terms of time required, for users of large type is practically as severe as that for users of braille; consequently, their need for a more rapid mode of communication is practically as great.

Other information obtained through this series of studies pointed up a serious problem of incompatibility between playback equipment, recording formats, writing equipment, and the techniques employed by students when using recorded materials to study. This problem was a result of the equipment and materials having been made for recreational purposes rather than scholastic use. This, coupled with the fact that the number of students depending on recorded materials was rapidly increasing, made it quite evident that a growing need existed for complementary hardware and software geared to aural study.

Early in 1968 a grant was obtained from the U. S. Office of Education, Bureau of Education for the Handicapped, enabling APH to continue with its listening research. One of the specific aims of this project was to design and build a system for study using recorded texts that would coordinate design of playback equipment, recorded book formats, and response systems around the goals for efficient study. Also specified was that the system be evaluated through user tests. Initial specifications for the resulting Aural Study System for the visually handicapped were determined from three sources. First, findings from individual interviews with public school students in New Jersey who regularly studied from recorded textbooks (Nolan, 1966) were reviewed. Second, an analysis was made of the tasks involved in studying from recorded material (Morris & Nolan, 1970b). And third, blind college students who traditionally studied from aural material were queried as to their ideas about recorded textbook format and as to the aural study methods they had worked out for themselves. Additionally, these students were asked for suggestions concerning both materials and equipment that would provide for more efficient use (Morris & Nolan, 1970a).

Working from these specifications, the Aural Study System was designed. It included four major components. These were an especially made record player incorporating the many special features designated as desirable for study purposes, a stereophonic record made for use with the special record player, a written key for use in locating places on the record, and a written supplement containing text material more easily used in written than recorded form.

One of the primary requirements for the Aural Study System was that it provide a means for rapid place finding; this being identified as the greatest problem students have in their use of recorded materials. With this goal in mind, the Aural Study System was designed incorporating two indexing features making possible both gross and fine search. When used in conjunction with each other, they enabled a user to find any desired place on a record with only a brief search period.

The original experimental recording made for use with the system was of a unit on Latin America taken from a world history book (Stavrianos, Andrews, Blanksten, Hackett, Leppert, Murphy & Smith, 1962) for tenth through twelfth grade use. The unit was contained on two sides of a 12-inch record recorded at 8-1/3 rpm. This represented 67 pages of the ink-print edition. Narrow bands about

1/16 of an inch wide divided the experimental recording into 11 parts; six parts being on side one and five being on side two. These bands had a single groove leading through them so that the stylus would be led from the end of one part to the start of the next part without physical intervention by the user.

The record itself was cut stereophonically, meaning that within each groove there were two tracks. Unlike commercial stereophonic systems in which both tracks are played simultaneously, the Aural Study System was constructed to play the two tracks independently. Therefore, different information could be, and was, provided on the two tracks of the record. On one track, the content track, text material was recorded at the rate of 8-1/3 rpm. This material was carefully edited in accordance with the consensus of suggestions coming from the student interviews and the task analysis and included page numbers which were read at appropriate places within the text. On the second track, the index track, index information was recorded at the rate of 66-2/3 rpm--eight times faster than the content track. Index information contained on the index track of the experimental recording consisted of page numbers; however, it could have been any kind of pertinent information. The position of the page numbers on the index track coincided with their position on the content track making it possible for a user rapidly to locate a specific page on the index track, then shift to the content track, and immediately hear the content of the desired page. On both tracks a sound signal was inserted immediately to precede the page announcements. This was done to serve as an attention getter.

A written key accompanied the record showing the parts found on each side and the pages found within each part. With this information, a user seeking a particular page could locate the page on the key and immediately learn the part in which it would be found and the side of the record on which the part would be located. By also noting the range of pages found within the sought part, the user could estimate how far into the part the sought page might occur.

The player was built with a variety of special features of which the most unique were related to its indexing capability. One of these was a photoelectric sensing device mounted in the tone arm which could be used to detect the bands on the record. Whenever this photoelectric sensing device passed over a band an audible signal, or beep, was emitted. The other means of indexing combined the player's multitrack capability with its rapid scanning

capability. By engaging either the fast forward or fast reverse operations, the turntable automatically shifted to its scanning rate of 66-2/3 rpm, and, simultaneously, the index track of the record was engaged. Thus, if a user was looking for a page the key had informed him was in the fourth part of the record, he would slowly move the tone arm inward across the record counting the "beeps" as he went. At the fourth "beep" he would know he was at the start of the fourth part. Then, he would estimate how far into the part the page might occur, set the stylus down there, and engage the fast forward mechanism. At the first page announcement, he would either have found the page or know what correction was needed. If he was looking for a subsequent page he would continue using the fast forward until the page was found. If he discovered he had gone too far into the part, he would engage the fast reverse, and back until the sought page was located.

The tone arm of the record player was of a new type featuring stylus pressure light enough to prevent record damage. This tone arm was one that moved horizontally across the record rather than having to be raised before being moved. In addition to the photoelectric sensing device, it contained a retractable pickup cartridge which incorporated a mechanism for positively identifying the record edge.

Other special features of the record player included a turntable pause mechanism featuring instantaneous turntable stop and start. This device enabled a user to stop, as to make a note, without having manually to back the turntable to correct for the glide that occurs on standard models when the turntable is stopped. Another feature unique to this record player was its variable speed control. With this, turntable speed could be increased halfway up to the next faster turntable speed setting or lowered all the way to the next slower turntable speed setting. As the player was built with a three speed capability (33-1/3, 16-2/3, and 8-1/3 rpm), combined use of the turntable speed control and the variable speed control would give a user control of turntable speed over a continuum ranging from 4-1/6 to 50 rpm thus enabling him to pick any desired playback speed. Being a mechanical adjustment, naturally distortion would be introduced as the playback speed varied from the rate at which the record was manufactured to play.

The record player had hand controls for all operations which included tone, volume, and off-on in addition to those already mentioned. Additionally, it had a foot control for the fast forward, fast reverse, pause, and play turntable operations. By use

of the foot control, a student's hands would be freed for other things such as note-taking or the examination of graphic material. Other features included an option of either speaker or headphone use.

From information obtained in the student interviews and the task analysis, it was apparent that certain parts of textbooks are more useful in written form than in aural form. To meet these needs a written supplement was provided in braille. However, parallel braille and large type editions are envisioned.

The written supplement accompanying the experimental record was a book containing a title page, a table of contents, and 34 sections. Each section was numbered and referred to on the record by its number (e.g., see supplement 7-9). In this case the seven represented the unit, Latin America being the seventh unit in the text, and the nine represented the ordinal position of the section within the book of supplements. Included in the 34 sections were an outline of headings, three spelling lists, nine maps, seven graphs, a chart, one table, seven sets of study questions, one set of unit activities, three sections of references, and an index. The index made it possible for a user to find the page(s) where specific items would be found. Important as this is to any student, it is a feature usually lacking from recorded textbooks because of the unwieldiness of its use in recorded form.

All components of the Aural Study System complement one another. Together, they provide a means for a visually handicapped student to obtain information in a thorough and highly efficient manner.

The original models of the four components of the Aural Study System were critiqued by a group of blind persons of professional status who were knowledgeable in the use of recorded materials. Their suggestions were compiled and reviewed by in-house committees at APH to determine what modifications should be made in the equipment and materials comprising the system.

After these modifications were incorporated into it, the next step in the evaluation of the system was to try it out, or field test it, with blind students. This was done in two initial phases. First, 36 students who were readers of braille were taught to use the system. These students ranged in grade placement from 5 through 12. Training was given during one regular class period on each day for the first three or four days of a week. On the following day a test was administered to measure the effectiveness of

the training. Results showed that the students could learn to use the components of the system quite easily. Problems in use of the player, the written supplement, and the record were documented so that further modifications could be made on subsequent models and versions. The second phase of the field test occurred approximately two months after the first. It involved the 24 high school level students who had participated in the first phase. These students were given one day of review and then spent three class periods (one per day) performing study type tasks using the system. Only high school level students were included in this phase of the field evaluation as the text material was not appropriate for use with students at lower levels. Following the training period, these students were tested on their ability to use the system to perform study tasks. Results demonstrated that these students could use the Aural Study System to perform the required tasks. These tasks included locating information for and writing out short form answers to specific study questions, copying quotations verbatim, outlining, and summarizing. Although the quality of the written responses varied, no particular difficulties were encountered in use of the various parts of the Aural Study System or in its use as an integrated system.

The third phase of the field test will be conducted during the 1972-73 school year. If students can use the recorded version as well as, or more effectively than, the written, advantages to its use would include cost, required storage area, and the fact that one version could be used by all visually handicapped persons rather than separate braille and large type editions being required.

At the time work commenced on the Aural Study System it was decided to develop it as a disc system in the belief that much of the information acquired from development of a disc system would be applicable to tape systems as well. Such thinking was justified as many of the new features appearing on tape systems for use by the visually handicapped, open reel and cassette, are those that were identified as desirable through the Aural Study System project.

One of the primary goals of the Aural Study System project was to provide a manual for use by the visually handicapped containing information on how to study from recorded materials. Additionally, this manual was to provide recording information for these students and their personal readers that could be used in making their own nonprofessionally recorded tapes better suited to meet

their needs. Such information would include suggestions on how to incorporate indexing information on the tape, how to handle headings, graphic material, picture captions, study questions, references, footnotes, quotations, new words, proper nouns, etc. This manual should become available during the upcoming school year.

In summary, it is abundantly clear that visually handicapped students can learn and do learn through their aural channels far more efficiently than through their tactual channels or their impaired visual channels. Consequently, it behooves us, their educators, to acknowledge this simple fact and apply our efforts accordingly.

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VOCOM* I - SPEECH COMPRESSOR EXPANDER

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It is generally conceded that we can comprehend the spoken word at rates that are double or even triple normal speaking rates. The difficulty is our physical limitations in articulating the words and syllables. For the last quarter of a century researchers have endeavored electromechanically to speed up speech and maintain intelligibility. Considerable success has been achieved, but, heretofore with a costly, difficult to use instrument. The VOCOM* I, now available from PKM Corporation is much less expensive, easy to operate, and results in more intelligible rapid speech. The implications for the education of the visually handicapped are obvious. The blind student can now ingest information as rapidly as the sighted student can read. The mind and ear are not limiting factors, students should be given this new alternative in learning.

I. Word Rates

Most people are familiar with word rates from recent interest in speed reading. Some sighted people have been trained to read as fast as 2000 words per minute. In the average printed book there are about 300 words per page so the fast reader speeds thru seven pages in a minute or a 350-page novel in less than one hour. Most people do not read that fast. In fact, the average sighted high school student reads at a rate of 250 words per minute so that he would read our 350-page novel in about 7 hours. The severely visually handicapped reader can read print at about half this rate or 150 words per minute so our book would take him 12 hours to read. The blind student may read braille as fast as 100 words per minute so for him the above novel consumes nearly 18 hours for completion.

Talking books for the blind are produced at the American Printing House for the Blind in Louisville, Kentucky, and American Foundation

for the Blind, New York, and distributed nationally by the Library of Congress. Numerous state and local groups also produce such material. These talking books are available in the form of discs, reel-to-reel tapes and cassett tapes. The reader for these materials usually verbalizes at least at 100 words per minute and rarely faster than 160 words per minute. At these rates improvement over reading print material or Braille for the visually handicapped is not significant.

The problem is not the ear but the vocal apparatus. There is even physiological evidence that not the hand but the ear is quicker than the eye. Our listening comprehension rate is better than 300 words per minute and for some may go as high as 800 words per minute. The problem is to produce speech compressed to these rapid rates and still maintain intelligibility. This has led to considerable work in the field of speech compression spanning the last quarter of a century.

II. What is Speech Compression?

Basically speech compression is the transformation of a passage spoken at a normal rate into a replica that contains the same verbal message but occupies a shorter time span. Ideally the compressed version would have the same intelligibility as well as maintain the same tone and voice quality as the original. There are numerous ways to increase word rates each with its own advantages and disadvantages. The most obvious is to play a recording at a faster speed. Play a [illegible]3 rpm record at 45 rpm, for example. This is called the speed changing method. If you don't speed it up too much you can understand it, but the tone is certainly changed and you won't be able to recognize the speaker. With some very sophisticated equipment called the harmonic compressor you can alter the pitch and then playback faster to restore original pitch and achieve compression. The same intelligibility as the speed changing method is obtained and voice quality is closer to the original.

Another method that has proved the most popular for the last fifteen years because of the available equipment is the sampling method. In this method very short pieces of the original material are periodically deleted and the remaining pieces brought together to make a continuous discourse. The deleted segments are so short that the original tone and voice quality are maintained. Furthermore, intelligibility is also maintained up to 250 to 300 words per minute. This method is also called systematic deletion since

segments are deleted systematically without regard for the portion deleted.

The method of compression employed in VOCOM* I is called Selective Deletion. In this compression method the verbal material is interrogated and the informationless pauses and highly redundant vowel sounds are drastically shortened. The transitional elements (most consonants) are maintained intact to preserve intelligibility. With this method original tone and voice quality are maintained.

III. History of Speech Compressors

Some early researchers accomplished the sampling method of speech compression by taking speech recorded on magnetic tape and cutting out 1/4" to 3/4" segments and splicing the retained segments together. The concept was proven but those who did the splicing were ready for a long vacation.

With the advent of large, high speed general purpose digital computers clever things could be done and any method of speech compression could be accomplished. The problem obviously is the cost to produce a compressed copy. No matter how costs come down we cannot supply every teacher or group of teachers with a computer that will accomplish the desired task.

A special purpose machine easy to use and not too expensive was needed. In the early 1950's a group in Germany[1] and a group at the University of Illinois[2] came up with such a device. The device electromechanically performed systematic deletion. Basically it consisted of a tape player, a tape loop with rotating heads and another tape recorder. The device first marketed by a German firm was called the Tempo Regulator. It was later improved and marketed as the Eltro Rate Changer Mark II and currently Mark III. The University of Illinois gave Discerned Sound of California exclusive patent rights to their invention which is currently marketed as the Whirling Dervish. These machines suffer from several basic disadvantages and hence have not enjoyed widespread use in the education of the visually handicapped. These disadvantages are: 1. They are expensive ($3500 or more). 2. They are difficult to use, in most cases a skilled technician is required. 3. They are difficult to maintain and adjust. 4. They suffer from the basic disadvantages of systematic deletion, intelligibility drops off rapidly with word rates in excess of 275 words per minute. There are electronic speech compressors under development which will probably overcome disadvantages 2 and 3. They may in a few years result in

a significant price reduction but they will never overcome 4.

VOCOM* I introduced by PKM Corporation in April of 1972 overcomes all of the above disadvantages. It is compact (the size of an overnight case), lightweight (17 lbs.), easy to use, maintenance free and currently sells for under $1000. Furthermore, it is the only compressor that uses Selective Deletion so higher word rates can be obtained. The hope is that now compressed speech can come out of the research laboratory and into the classroom.

IV. Implications for Secondary Education of the Visually Handicapped

Because of available equipment almost all subjective testing done in the past used the sampling method of compression. Preliminary tests show that speech compressed using Selective Deletion is more intelligible and more comfortable to listen to.

An early piece of research[3] done by Foulke, Amster, Nolan and Bixler shows that, even with the sampling method of compression, comprehension of blind listeners for both literary and science material decreases only slightly as word rate goes up from 175 words per minute to 275 words per minute. Numerous other studies of comprehension of compressed speech give the same results. Degradation at faster rates is due in part (if not entirely) to the compression method.

Another facet of speed listening is the increased efficiency. If a student gains only half the information in a passage but covers twice the material in the same time his knowledge intake per unit time is still the same. In point of fact he comprehends much more than half. Tests have shown that in measuring information per unit time that 275 words per minute is the most efficient listening rate. The compression method in all these tests was systematic deletion.

In the use of compressed speech in the education of the visually handicapped student we must be aware of his verbal abilities. The sighted student learns to read printed matter in first grade. He is already accustomed to listening and comprehending at perhaps 80 words per minute. His reading ability slowly increases and by 4th grade the average student reads at 150 words per minute or higher. By high school his reading rate is 250 words per minute and in many cases much higher. On the other hand a blind person has *never* had material presented to him faster than about 175 words per minute.

As the sighted student is trained to increase his verbal skills and improve his reading rate so the blind student needs training to increase his verbal skills and improve his *listening rate*. Once trained, unlike speed reading, the capacity for speed listening is maintained. Since aural material presented to the ear forces the word rate on the listener, blind students can be trained to listen to faster and faster rates and compete with sighted students in reading rate.

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A COMPARISON OF THE EFFECTIVENESS OF STANDARD PRINT AND LARGE PRINT IN FACILITATING THE READING SKILLS OF VISUALLY IMPAIRED STUDENTS

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The Problem

Educators of visually impaired children are increasingly concerned to help them make the maximum use of residual vision by: (1) direct training of visual skills, (2) use of low vision aids, and (3) use of large print materials.

This concern has been brought into focus by the realization that the majority of visually impaired children--including many in the legally blind category--are print, not braille readers, and that the increasing reading load in schools today, together with the trend toward educating visually impaired children in the public schools, puts an inordinate burden on the handicapped child unless he can utilize the same materials as his peers and be assisted to achieve comparable levels of attainment in the tool subjects.

Though objective evidence is lacking regarding the relative merits of standard print and large print in facilitating the reading skills of visually impaired children, a trend towards greater use of large print can be observed, especially in the last five years with the entry of a large number of publishers into the large print market.

Purpose of the Study

The purpose of the study was to determine whether visually impaired high school students performed differently on measures of comprehension, reading speed and visual fatigue on standard print and

large print material, and what relationship preference for a particular size of print had on reading performance. Additionally, it was decided to explore any differences between the performances of partially sighted and legally blind students.

It was hypothesized that visually impaired high school students would attain higher scores on the standard print test than on the large print test, and that partially sighted students would score higher than legally blind students. It was also hypothesized that visually impaired students would perform equally well on preferred and non-preferred size of print.

Design of the Study

Subjects

Twenty-four legally blind and 17 partially sighted students took part in the study. All students had been judged capable of reading print and had received a very thorough optometric evaluation and, when necessary, had been fitted with corrective lenses for near vision.

Procedure

In order to equalize practice efforts and fatigue factors favoring either standard print or large print, the students were randomly divided into four groups and the presentations of the standard print and equivalent large print forms of the Davis Reading Test were alternated. All students were tested individually by the writer. They were free to choose whatever low vision aids they required and were allowed as much time as they needed in order to complete the test.

Materials

Two equivalent forms of the Davis Reading Test, consisting of reading passages followed by multiple-choice questions, were utilized.

Test modifications

The Davis Reading Test was made available in standard (10-point) print and in large (18-point) print. The reading passages were placed on the left-hand pages with the multiple-choice questions opposite them on the right-hand pages.

Test conditions

The students were tested under flexible conditions. Each student was free to choose his most comfortable reading distance and level and angle of illumination. Optical and non-optical aids were freely

available and unlimited time was given in which to complete the tests.

Test measures

The students read the timed test passages silently and responded orally to multiple-choice questions which were scored by the examiner. Measures of comprehension, reading speed, reading distance and visual fatigue were obtained. After completing the second test the students were asked to state their preferred size of print.

Analysis of the Data

The hypotheses concerning preferred size of print were analyzed using a two-tailed t-test concerning means on related samples. All other hypotheses were tested using a three-way analysis of variance.

Conclusions

The prediction that visually impaired students would perform better in standard print than in large print on measures of comprehension, reading speed and visual fatigue was not accepted. However, performance was as good on the standard print test as it was on the large print test on the measures of comprehension and reading speed. The comprehension of both the legally blind group and the partially sighted group was as good on standard print as on large print, and both groups read standard print as quickly as they did large print. Furthermore, the legally blind students found standard print no more fatiguing to read than large print. The only advantage conferred by large print was found among the partially sighted students who experienced less visual fatigue when reading large print than when reading standard print.

Partially sighted students read faster than legally blind students but the two groups achieved comparable levels of comprehension.

Performance was found to be as good on the non-preferred print size as it was on preferred print size.

Large print offers little advantage insofar as reading distance is concerned, and no advantage to those students using strong corrective lenses.

Visual acuity was not related to performance on the measure of comprehension, but both standard print and large print were read faster

by those students with higher acuities who also experienced less visual fatigue on large print.

Speculations regarding the relationship of I.Q. to performance were inconclusive.

The writer therefore concludes that standard print is as effective as large print in facilitating the reading skills of comprehension and reading speed for both legally blind and partially sighted students. Large print appears to offer an ease of seeing for those students whose visual acuities approach the normal range, but offers little advantage in an increased reading distance. No reliance is to be placed on a subjectively determined preference for a certain size of print. Higher visual acuity enables both standard print and large print to be read faster but does not facilitate comprehension any more than does lower visual acuity.

Recommendations

The students in this study were fortunate in having thorough and repeated optometric evaluations that included correction for both distant and near vision. Specific assistance was given to motivational problems and in aiding the students to understand and use their optical aids effectively. The students also received direction in the utilization of visual skills, the initial thrust of this recently introduced program being toward the teaching of print reading and the overcoming of emotional barriers to reading. It is recommended that this type of assistance be provided for all visually impaired children. Parental education and involvement is seen to be crucial since the parents of a number of students were procrastinating about allowing their children to be fitted with the necessary optical aids.

There is reason to believe that those visually impaired individuals who have received correction for near vision and who can see well enough to read print should, in most cases, be able to use standard print materials. Attention must be given, however, to providing optimum reading conditions. Large print will continue to have value for many people with very low acuities who cannot for physical or psychological reasons use standard print, or for those whose work demands an increase in the size of print.

Evidence presented in this study points out how unreliable visual acuity is as a guide to reading ability, though higher acuity undoubtedly facilitates reading speed. It is therefore recommended

that emphasis should be placed on an individual appraisal of each visually impaired student to ascertain his functional use of vision. An objective measure of the reading skills of each individual is needed, rather than placing reliance on a subjective preference for a certain size of print or on offering guidance based on a measure of visual acuity.

Despite the adequate illumination in the room in which they were tested, most of the students in this study chose also to use an angled reading lamp at high intensity when taking the test. It is therefore recommended that an adequate number of reading lamps having variable intensity levels be made available in classes for the visually impaired.

For those who read by holding the book very close to the eyes, it is considered better to move the book rather than the head when scanning the lines of print. The writer found that the majority of students used the latter method and most of them made frequent changes of posture, some holding the book close up to the face, others placing the book flat on the desk and hunching up over it to read. Very few chose to use a reading stand. It is therefore recommended that students be taught how best to read by moving the book in front of the eyes. Research is recommended to devise a means of holding the book at eye-level that would enable the individual to move the page horizontally across his field of vision and, at the end of each line, move the page vertically and across to the beginning of the next line.

Where large print materials have to be used it is recommended that the size and weight of the book be reduced, and that the binding be such that the pages can be flipped over to be held against the back of the book--a very effective means of reducing its bulk.

This study is limited in that the period of reading demanded of the students was rather brief. Research is therefore indicated to determine which size of print best facilitates longer reading periods. Research is also needed to explore the use of large print materials vis-a-vis optical aids. It could be that it is less fatiguing for some individuals to read large print without optical aids than it is to read standard print with the help of optical aids. In view of the slow reading rate of the visually impaired students it would be of interest to determine whether rapid reading techniques might foster speed of reading. Also it must not be forgotten that if a student reads at a very slow rate his main mode of imput may have to be an auditory one to overcome the difference in reading rate between the sighted and the visually impaired.

DEMONSTRATION OF THE

PEABODY LANGUAGE DEVELOPMENT KIT LEVEL # P

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What is language--and what is it that we as teachers are trying to develop when we begin a language development program?

Dr. Tina Bangs, who is prominent in the field of language and learning disorders, defines language in its broadest sense as communication. Communication begins as action and results in some kind of response between people.

Teaching children to become aware of, to modify, and to control their own actions which automatically illicit some response in others, is what language development is about. But it is more! Language develops from concrete experiences. One good graphic illustration depicts language as a tree. Its roots are sensory experiences which need as nurturing soil an accepting and stimulating environment plus time for growth and maturation. The trunk of the tree represents the interpretation of the stimuli received by the senses--hearing, seeing, smelling, tasting, and touching. The limbs of the language tree are listening, thinking, talking, reading, and writing. Now language becomes an expression of what has been received and interpreted or conceptualized.

In a program for language development the foremost goal is to provide concrete sensory experiences for the child in an environment that is stimulating and accepting. Allowing the child to mature and grow at his own rate, giving him time, is essential. It is necessary to utilize a multi-sensory approach to stimulate all of the senses each child has working for him.

The Peabody Kits are designed to stimulate the receptive or sensory channels, especially auditory, visual, and tactual. These

Kits enable the child to build concepts, that is, to interpret, sort, code, and associate what is received through the senses, and finally to express himself vocally or motorically. "The emphasis is on listening, thinking, talking, and understanding speech and verbal relationships through activities that are highly motivating." (Peabody Manual, Level #P, p. IX)

There are four levels of the Peabody Kit: Level #P, Levels #1, #2, and #3. Level #P is the most recent and the lowest level. In 1967-1968 this Kit was introduced to expand the materials downward so that an early and continuous language program could be provided for children with mental ages of three through ten. Although the materials in the Kit were designed for the overall language development of disadvantaged and retarded pre-school children, they do work effectively for visually impaired children in kindergarten and first grade.

The #P Kit contains a manual with 180 daily lessons. Although a few lessons are not well received by individual groups of children, the manual is generally well planned and easy to use with a minimum of preparation. Some of the activities stressed in the manual are listening, following directions, naming, remembering, sentence building, sound identification, describing, guessing, pantomining, and touching.

There are two metal carrying cases. The smallest case is 14" x 8½" x 11". It contains a set of 396 vocabulary building stimulus cards. These 7" x 9" cards are in color and are relatively free of shadow. Many are outlined in black making them especially effective for children with low vision. The stimulus cards are lithographed on triplex-laminated playing card stock and plastic coated for durability. The weight of the card makes labeling in Braille easy and effective. The upper right hand corner of each card has been snipped making concepts of top-bottom, and right-left easy to demonstrate. This card file encompasses the broad general areas of clothing, animals, food, transportation, toys, household items, community helpers, number concepts, and story cards.

Other manipulative materials are in abundance, and are especially enjoyed by children who are visually impaired. Three colorful puppets (P. Mooney, Elbert the Elephant, and Gasless Goose) come to life for the children through stories and activities. There is a P. Mooney Bag which is large and made of cloth. Activities which stress memory, guessing or identification by touch are enhanced by the P. Mooney Bag. Magic becomes possible in the classroom by a

wave of the P. Mooney Stick or wand. Helping children pretend, stimulating the imagination is a vital part of this language program. For introducing songs for language development there is a xylophone with hammer as well as six music cards. Two hundred-forty plastic chips in eight colors are useful for behavior modification tokens, counting, color concepts, or development of fine motor skills. Forty-five magnetic geometric shapes provide stimulating manipulative activities to teach shape, size, and color. Twenty-two other magnetic strips are included to teach concepts of length and width.

The large carrying case can be used to display the magnetic materials. In addition it provides storage for twenty-one plastic fruits and vegetables. It is always desirable to provide initial experiences with real objects and then to proceed to three dimensional replicas followed by pictures. The colorful, life-like plastic food items are durable and well received by children because they like to eat and enjoy handling and talking about foods.

Two solid manikins and thirty-three items of vinyl clothing are housed in the large case. These materials have not proven effective for me for groups larger than four. The small number of manikins and the difficulty in manipulating the vinyl clothing causes confusion and frustration when the group is large.

These materials, as well as one disassembled manikin consisting of nineteen body parts, are useful in teaching body parts and naming clothing appropriate for the season and occasion.

Included in this Kit are ten 7" records with P. Mooney stories and songs for language development. Sounds of the environment to develop gross sound discrimination include: Sounds of Animals, Sounds of the Home, Sounds of Ways to Travel, Sounds of Toys, Sounds of People, Sounds of Places, Sounds of the Circus, Sounds of the Department Store, etc.

Not suitable for Braille students are six 28" x 43" story posters. If the children have fairly good vision, the posters are excellent stimulus materials.

To make the Peabody Kit work for the development of this global aspect of language there are several important considerations. Language or Talking Time should be scheduled as part of each week's activities. Ideally, daily lessons should be presented. Our school provides three thirty-minute sessions each week.

This is a talking time for the children. The activities are child-centered and taking turns and assuming leadership roles is an important aspect of this program.

The manual proceeds from easy to more difficult and thus using it sequentially is important.

Within one lesson there may be stress upon such aspects of language as:

1. Having a conversation.

2. Taking turns.

3. Increasing vocabulary.

4. Verbalizing feelings.

5. Gross auditory discrimination.

Each lesson accomplishes its goal without reading, writing, or drill as we usually think of it. It should provide a break in the daily school routine when spontaneity, conversation and activity are encouraged and rewarded.

TOYS FOR TOTS

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Introduction

During the last ten to twelve years, a general awareness of the potential of young children and the importance of parents in children's early development has permeated the thinking of educators and researchers alike. Young children and their parents have been discovered! The Age of Aquarius is gone; the Age of Early Childhood Education is here. A forward thrust is being focused on early identification and intervention programs. At present, educators appear to be in agreement concerning the value and need for early education but are not in agreement as to how it should be done. The literature is bulging with reports of the many efforts in experimental early education--projects, studies, and claims of intervention programs, all designed to compensate for the many developmental disabilities of young children with various physical and/or environmental deficits.

Instructional Materials Center Project

This paper concerns a two-phased project developed by the Instructional Materials Center, State of Illinois--a project designed for developing a parent-involved program for severely, visually handicapped pre-school children. PHASE I concerned children aged 0-3 years; PHASE II concerned children aged 3-5 years.

PHASE I

PHASE I of this project was a unified effort of the Instructional Materials Center, State of Illinois, and the Title VI, ESEA program in Springfield, Illinois. In the pre-planning stage, Gloria Calovini, Director of the Instructional Materials Center, Illinois, presented the idea to the Title VI personnel and invited its coop-

eration. This combined effort was strengthened by the assistance and talents of a working committee composed of 18 additional Illinois people interested in young children, including parents.

Goal

The goal of PHASE I was the development of three sequential toy kits for the very young blind child to use in his home, with parental guidance. Each kit was developed for an approximate age group. KIT #1 for 0-1 year; KIT #2 for 1-2 year olds; and KIT #3 for 2-3 years old. Commercial toys as learning materials were evaluated and selected for their value in challenging and stimulating sequential development in the child. The kits were not meant to be all inclusive. An informational booklet, written to the parent, was included for parent guidance in the use of the toys in the kit. Included also in each kit were two comprehensive guides: "Guide for Parents of Pre-school Visually Handicapped Children" written by Dorothy Bryan and published jointly by the Office of the Superintendent of Public Instruction, The Instructional Materials Center, Child and Family Services, and three regional Title VI projects in Illinois in 1970; and "The Visually Impaired Child: Growth, Learning, Development -- Infancy to School Age" by Carol Halliday of the American Printing House for the Blind, Louisville, Kentucky, in 1970. The Instructional Materials Center accepted the responsibility for distribution of the kits. At present, 12 kits have been distributed for field testing.

Philosophy and Rationale for a Parent Involved Program

All children, including the visually handicapped, come into the world as tiny, stirring, curious, little, reflex beings. Each begins to learn at birth and each will become a product of all his experiences. All have basic needs. First learnings are involved with moving. The infant is said to be in a sensory stage--he reacts to sounds, tastes, sights, smells, touch, and movement. For the young blind infant, the visual channel is missing, but for most, the other sensory channels are intact. All children, including the blind infants, react to feelings and emotions--as they are held, fed, bathed, or changed. Through these early learnings, each becomes aware of himself, then others, and then his environment. As he becomes a toddler, he will explore, discover, and assimilate a lot of information from his ramblings. His curiosity forces him to be highly motivated by the materials around him. As he continues in this sensory stage (from 1 to 2 years), he continues to listen, to smell, to taste, to manipulate, to move, and to look.

His general motor patterns, both gross and fine, develop and he learns to handle himself. He rolls, sits, crawls, walks, runs, and jumps. He pushes, pulls, grasps, and releases--all movements he will later transfer into such activities as holding a spoon, grasping a cup, and buttoning his coat. With the general motor patterns pretty well under control, his specific motor patterns develop--especially eye-hand coordination, which he will later use in reading and writing. Because the blind child "sees with his hands" and discriminates auditorilly, he will develop "ear-hand" coordination. Along with the special motor pattern development, the child begins to babble and talk. As his language develops, he begins to put names and meanings to his sensory experiences and moves on to the perceptual-motor stage of development. All this busy work is called PLAY. For all young children, play and learning are inseparable, and through their playthings, meaning is given to their world. Because play is a way of learning by doing, and toys are the essential tools, the reward will be greater if such play is in an enriched stimulating environment with a good emotional climate. The child is busy getting his prerequisites for entering first grade and academic work. Whether this future education will be developmental, or remedial will depend upon the foundation laid in his early years. The way he feels about himself, his own self-respect, confidence, and worth, will be a combination of his own sense of trust, his own sense of autonomy and his own sense of identity. All this will depend on how well he has been accepted, stimulated, and appreciated. The little blind child is unique. He has the needs of all other children, plus more. To experience his world, he will need more motivation, encouragement, and instruction. He needs a systematic introduction to his world, to people, to things around him, and even to himself(3). He will need to be helped to develop his own self-awareness, his awareness of others, and his awareness of the space around him. Because he cannot see, he needs to be handled more, talked to, and shown how, if he is going to explore and understand his environment. He needs to have his curiosity stimulated--and if he is going to get anything from his toys, he will have to be shown how to find and play with them.

Parent Involvement

Responsibility falls heavily on parents as the first teachers a child knows. Whether the child learns to trust, or mistrust; feels capable of making his own decisions, or doubts himself; whether he has self-initiative, or guilt; whether he is industrious, or willing to let others do for him--all his own feelings about himself will be dependent upon how well his parents performed their tasks

in his early years. Self-worth and a sense of dignity are important to us all. The greatest need of a young blind child is to have parents who understand his problem, can adjust to it, and can foresee his immediate and future needs. Parent understanding and participation are especially needed by the young blind child in his earliest years. The current trend in education is to include parents as an integral part of all education programs for handicapped children. Not only does this involvement help produce a more capable child, but it also provides for the needs of the parent. Through encouragement to develop his parental skills, the parent may be helped himself as he goes through such emotional levels as shock, panic, denial, and retreat, before he can finally adjust to his child's disability.

Home guidance programs help a parent in several ways:

1. Knowing where a child is in his developmental sequence.

2. Knowing how to look ahead to the next step in his development.

3. Knowing how to use techniques and equipment in helping his child move to the next step.

4. Understanding the importance of daily practice (for both child and parent).

5. Understanding that for the very young, input is necessary before output can be expected.

The intent of this project was to provide information and guidance to the parent in the use of challenging and stimulating toys for sequential development in self-awareness, gross and fine motor ability, language and cognitive ability, and social skills for the very young blind child. The toys selected for the kits were commercially-made toys. It was hoped that with parental interest and involvement, the experience for both child and parent would be enjoyable.

Procedure

A statewide committee was selected and invited to attend a two-day workshop. Representatives of toy companies were also invited to attend and display their wares. At the first workshop, the committee was divided into four groups. Preceding the presentation of the toy representatives, the committee members were briefed on the

evaluation techniques to be used (see evaluation charts). Following presentations from the "toy boys," each member was asked to evaluate each toy on an evaluation sheet, designed and prepared in advance, keeping in mind that the toy would be used by a blind child. The groups were divided under the following headings:

Group I Toys for Early Motions

Group II Toys for Gross Motor Motions

Group III Toys for Fine Motor Motions

Group IV Miscellaneous

In general, the factors for consideration in the selection and evaluation of the toys were:

1. The purpose the toy serves in accomplishing its aim.

2. Interest of the child--Is it fun?

3. Adaptability of the toy for various uses and age groups (multi-purpose).

4. Opportunity for development of:
   - Body image concepts.
   - Gross and fine motor ability.
   - Directionality, laterality, and spatial awareness.
   - Balance and coordination.
   - Manipulative, constructive, creative ability.
   - Early concepts.
   - Identification.
   - Social and emotional behavior--"joy of living."
   - Language and communication.

5. Safety factors: trustworthy, well made, durable, non-toxic, rounded edges.

6. Ease of handling. For the infant, is the toy large enough it cannot be swallowed? Is it soft and cuddly? Is it light?

7. Ease of keeping clean.

8. Does the toy provide for early sensory development (hearing, feeling, tasting, kinesthetic, smelling)?

9. Does the toy attract?

The data were compiled and on the second day of the workshop, returned to each group, who then met separately to summarize, classify, and list the value of each toy as to its auditory, tactile, kinesthetic, and body image concept stimulation. Before dismissing, the entire committee reconvened. Catalogs and forms were provided for the final selection of toys in each group. A writing committee was appointed for preparing the booklet for the parent. At a second two-day workshop, the final selection of toys was made, and the booklet presented and discussed before preparation for final publication.

Slides

The Instructional Materials Center now has a stereo-slide presentation for use in workshops and a booklet explains the purpose, the sample toy, and the manufacturer for each.

PHASE II

PHASE II of this Instructional Materials Center project again was a committee project--this time with 24 members, some from PHASE I and some new members.

Goal

The goal of PHASE II was the development of a comprehensive "Guide for Parents" for blind children ages three to five. Whereas the emphasis in PHASE I had been on the use of commercial toys, the emphasis in PHASE II was on activities and games for sequential development in self-awareness, gross and fine motor ability, language, communication, cognitive ability, and social skills. Again the committee was divided into groups, each group assigned to prepare sequential activities for one area of development. Following the first workshop, these groups met at convenient places throughout the State and compiled their materials. At the second two-day workshop, each group presented its work for discussion by the entire committee. A writing committee was appointed and following several meetings, completed the guide. This is now in the hands of the publisher and should be ready for distribution September 1972. Seven sections are included in this guide to be published as an easily understandable chart-like manual. Each page will have three vertical columns, each representing an age level--3, 4, 5. The

seven sections are:

I WHAT DO I TOUCH? (Tactile Discrimination)
- Size
- Shape
- Texture
- Temperature
- In School

II WHAT DO I HEAR? WHAT DO I SAY? (Auditory Discrimination)
- Where Is The Sound?
- How Are Sounds Different?
- What Does The Sound Mean?
- Is The Sound Important?
- What Do I Hear?
- How Do I Answer?
- What Do I Hear At School?

III I USE MY BODY. (Body Image)
- This Is My Body
- This Is Your Body

IV I CAN DO IT. (Self-Help)
- Let's Eat
- I Can Dress Myself
- I Go To The Bathroom
- I Wash My Hands And Face
- I Brush My Teeth
- I Comb My Hair

V THE CHILD LOOKS AT HIMSELF. (Identity)
- Who Am I?
- Who Are My Friends And Family?
- I Like Myself
- I Like My Family
- This Is My Home--My Yard

VI WHAT DO I SEE? (Minimal Vision)
- At Home
- In My Neighborhood
- At School

VII LET'S WALK. (Mobility--Motor Development)
- I Walk At Home
- In The Yard
- In My Neighborhood

At School
I Can Stand Straight
Run
Jump
Hop
Skip
What Do I Smell At Home?
In The Yard And Neighborhood
Distance And Direction
Number

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EVALUATION OF TOYS FOR YOUNG BLIND CHILDREN
(Six Months To Three Years)

TOY _____ DESCRIPTION _____

GROUP I EVALUATION FACTORS EARLY MOTIONS	AGE LEVELS				
	0-6 mo.	6-12 mo.	12-18 mo.	18-24 mo.	2-3 yr.
Offers Results From Random Motions					
Encourages Use Of Both Hands					
May Be Used With One Or Both Hands					
Useful For Grasp And Release Training					
Useful For Reach And Placement					
Encourages Babbling					
Sound Attracts					
Action Attracts					
Encourages Leg Motions					
Encourages Locating Toy					
Develops Early Tactile Discrimination					
Gives Satisfaction - Pleasing					

EVALUATION OF TOYS FOR YOUNG BLIND CHILDREN
(Six Months To Three Years)

TOY _____ DESCRIPTION _____

GROUP II EVALUATION FACTORS GROSS MOTOR	AGE LEVELS				
	0-6 mo.	6-12 mo.	12-18 mo.	18-24 mo.	2-3 yr.
Requires Big Motion Action (trunk, arm, legs)					
Encourages Locomotion					
Offers Resistance For Development of Strength					
Provides Opportunity For Problem Solving					
Develops Body Image Concepts					
Develops Spatial Awareness					
Encourages Balance Activities					
Requires Steady Movements					
Encourages Shoulder Motions					
Encourages Leg Motions					
Gives Satisfaction Of Achievement					
Auditory Facilitation					

EVALUATION OF TOYS FOR YOUNG BLIND CHILDREN
(Six Months To Three Years)

TOY _____ DESCRIPTION _____

GROUP III EVALUATION FACTORS FINE MOTOR	AGE LEVELS				
	0-6 mo.	6-12 mo.	12-18 mo.	18-24 mo.	2-3 yr.
Requires Fine Coordination					
Develops Tactile Discrimination					
Encourages Wrist Motion					
Encourages Elbow Motion					
Encourages Supination					
Encourages Opposition					
Encourages Size Discrimination					
Encourages Form Perception					
Encourages Concentration					
Requires Steady Movements					
Develops Body Image Concepts					
Encourages Pincer Motions					
Auditory Facilitation					

EVALUATION OF TOYS FOR YOUNG BLIND CHILDREN
(Six Months To Three Years)

TOY_____ DESCRIPTION_____

GROUP IV EVALUATION FACTORS MISCELLANEOUS	AGE LEVELS				
	0-6 mo.	6-12 mo.	12-18 mo.	18-24 mo.	2-3 yr.
Safe Non-toxic Rounded Corners					
Large Enough - Child Cannot Swallow					
Sturdy - Well Built - Trustworthy					
Easy To Clean, Wash Or Sterilize					
Sound Attracts					
Action Attracts					
Encourages Persistent Effort					
Can Be Used In Various Positions					
Adaptable For Simple Or Complete Movements					
Gives Satisfaction Of Achievement					
Encourages Speech					
Encourages Rhythm					

EDUCATIONAL MATERIALS FOR EARLY CHILDHOOD EDUCATION

Fay Woody Leach
Educational Materials Research & Development Specialist

American Printing House for the Blind
Louisville, Kentucky

Materials selection is one of the last steps in the process of educational programming. Briefly, the process could be divided into six general steps:

1. Know the child (or group) with whom you are to work. An understanding of his characteristics should include both abilities and disabilities.

2. Consider the areas of educational concern. There are different methods of categorizing educational goals. These goals should include: motor skills, mobility or premobility skills, self-concept formation, communication skills, self-care and daily living skills, sensory development, and cognitive processes.

3. Outline the behavioral goals for each of the above educational concerns. These should be specific goals such as developing hand grasp or learning to identify parts of the body.

4. Program your educational procedures. These need to be detailed and sequential.

5. Locate and utilize materials and equipment.

6. Evaluate the entire procedure.

There is a wealth of materials available for use with the young blind child; many of these require little or no adaptation. Two materials listings prepared through the Instructional Materials Reference Center at the American Printing House for the Blind are:

1. "Commercially Available Instructional Materials for use in the Development of Elementary Readiness Skills in Young Visually Handicapped Students"

2. "Commercially Available Recorded Instructional Materials for the Development of Communication Skills"

The area in which there seems to be the greatest need for adapting or developing new materials, especially for multiply handicapped visually impaired children, is language development. At the elementary level, much of what is available in language materials is too visually oriented.

A number of guides which aid in the knowledge of materials used by visually handicapped students have been developed in recent years. "The Visually Impaired Child: Growth, Learning Development - Infancy to School Age" (APH 8-5104, 50¢) by Carol Halliday and "Toys for Early Development of the Young Blind Child" available through the Illinois IMC are examples of these.

Materials selection must be thought through very carefully. The following questions can be used as a guide in selecting instructional materials for young blind or multiple handicapped visually impaired children. The relevance and significance of each question will depend upon specific needs and purposes:

1. Is a multi-sensory approach emphasized? Is the development of the senses, preferably more than one sense modality, promoted?

2. Are the materials multi-purposive? Can they be adapted in a number of ways?

3. Is practicality stressed? Is there a focus on everyday situations and prevocational skills?

4. Is simplicity incorporated into the design? Are non-essential elements eliminated?

5. Are the materials highly motivating? Do they have built-in rewards? Do they use a high interest, low vocabulary approach?

6. Is the learning of basic skills and knowledge incorporated? Are these materials designed to help teach elementary concepts which may be accomplished by other children through incidental learning?

7. Are the materials structured for sequential learning? Are they programmed from the very simple to the more complex?

8. Is each item sturdy and durable? Can it be used by older children who function on very elementary levels?

9. Are these materials as safe as possible?

10. Do the materials deal more with concrete experiences than with abstract concepts? Is the child involved in learning by doing?

11. Do the materials focus on the development of communication and language? Is the area of listening skills development fostered?

12. Is independent functioning promoted?

13. Can the materials be used by parents?

14. Do the materials provide for repetition? Are they designed to present the same concept in a variety of ways?

15. Do the materials meet the needs of the older child? Are these items of particular value in the light of a limited quantity of instructional materials available for older multihandicapped visually impaired children functioning on an elementary level?

16. Do the materials aid in reaching the educational objectives outlined?

Instructional materials use can be greatly increased by taking time to brainstorm concerning new and creative ways to use items in addition to those uses which are readily apparent. A simple work-play tray could be used to teach directional concepts, textures, comparisons, and location, to name just a few concepts. All these would be in addition to its obvious purpose of facilitating activity and storage.

In summary, let me say that there are three questions regarding instructional materials that teachers face: (1) What is available? (2) How do I choose the best materials for my students? (3) How do I get the most use from the materials I have?

Finding answers to all three of these questions will greatly improve the educational program for visually handicapped children.

MOVEMENT EXPLORATION AND GYMNASTICS FOR VISUALLY HANDICAPPED CHILDREN

Elizabeth Rae Parker, Teacher

Texas School for the Blind
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A major problem encountered by many visually handicapped individuals is an inability to move freely in space. This restriction of movement is often considered to be the major disability with which the individual must learn to cope. Therefore, during the spring of 1971, a study was designed to test the effects of a gymnastics program on the orientation and mobility skills of young, visually handicapped children. It was hypothesized that the children who participated in a 5-week gymnastics program would have significantly superior orientation and mobility skills when compared with children who did not participate in the gymnastics program.

The subjects of this study were 30 students enrolled at the Texas School for the Blind, Austin, Texas. The children were homogeneous according to sex, age, and amount of vision (partially sighted or totally blind). One child of each matched pair was randomly assigned to a control group and one to an experimental group. A modification of the Orientation and Mobility Scale for Young Blind Children by Francis Lord was administered to the children. Following the pre-test, the experimental group participated in a 5-week program of gymnastics which consisted of activities in tumbling, trampoline, and balance beam.

The gymnastics program consisted of the traditional skills taught to children in each of the three activities. The children met with my staff and me for 45 minutes a d five days a week. (Five undergraduate physical education majors ..om the University of Texas assisted with the program.) The children spent approximately 25 minutes working on tumbling skills, 10 minutes a day practicing on the balance beam, and five minutes every other day practicing on the trampoline. This short amount of trampoline time was

unfortunate but necessary because the trampoline was too small to accommodate more than one child at a time, and no more than eight or nine children could practice in one class period. Formal lesson plans were not followed because it was felt that the children should be allowed to progress at their own rates. A total of 21 tumbling stunts were taught. These ranged from the simple log roll and forward roll to dives over rolled mats and head stands. Also included were several partner stunts such as the "Chinese get-up," "leap frog," and "squash pyramid." The children learned 12 stunts on the balance beam, such as stepping over a wand and walking on the heels. Nine stunts were learned on the trampoline. In addition to the basic stunts, most of the children learned to do a dogey drop to a front drop, and several learned to do forward flips. The control group did not receive the concentrated gymnastics program, but did participate in the regular physical education program.

The Modified Orientation and Mobility Scale used for this study consisted of six items. Item I measured the quickness and skill with which the child could navigate stairs. Item II measured the child's ability to judge the height of a bench, climb on a bench, and jump off without losing his balance. Items III and IV measured dynamic and static balance, respectively. The accuracy with which the child could orient himself by making 90 degree, 180 degree, and 360 degree turns was measured by Item V. Item VI measured the distance a child veered when trying to walk a straight line.

Analysis of post-test data revealed significant differences between the control and experimental groups on static balance and orientation as measured by the facing movements item. The control group was able to balance for a significantly longer time than was the experimental group (significant at the .05 level). The experimental group was significantly (beyond the .01 level) more accurate in facing movements than the control group. No explanation for the regression of the experimental group on the static balance item could be determined. The investigator could only suggest that the item was not an adequate measure of static balancing skill.

The gymnastics program was beneficial to the children in a number of ways. First, muscular strength was greatly improved. Children whose muscular development was so poor that they could not even get onto the trampoline or balance beam by themselves were able to do so by the end of the five weeks. Second, each child's confidence in himself greatly improved. Children who would cling to the wall when walking down stairs began to move down the stairs confidently and with no assistance. Those who were afraid to try new stunts

finally developed an eagerness to try anything new. Third, statistical analysis of the data showed that, as a group, the children were able to orient themselves much better after the program than they were before it. I believe that the tumbling and trampoline activities were especially beneficial. To succeed, the child must know where each part of his body is in relation to the other parts, in relation to the tumbling mats or trampoline bed, or in relation to his partner. Both statistical analysis and observation of individual children indicate that a child who learns to orient himself when in the unusual gymnastics positions also learns to orient himself when in the normal upright position.

While I obtained some very encouraging results from the gymnastics program, there remained one very important question: What can a teacher do to help children who are not motorically ready for successful participation in tumbling and gymnastics? The answer, when I finally found it, was simple, and I began developing a program in "movement exploration." Movement exploration may be defined as a problem-solving approach to helping the child understand the use of his body in movement. The program has four main purposes: (1) to develop the motor skills necessary for participation in the sports-skills program which begins in the fourth-grade year, (2) to develop greater confidence in one's body and in one's ability to exercise some control over the environment, (3) to develop orientation skill, and (4) to develop an adequate body image, which includes not only the ability to name body parts but also the ability to know where the body is and what the individual can make his body do for him.

Before beginning a movement exploration program, the teacher must be sure that the children are able to name their body parts. Much of the program involves asking children to do various things with hands, knees, legs, etc. Time will be wasted if the teacher must stop to show each child the location of a particular body part.

The child begins the program by exploring his "personal space." Personal space is all the area within reaching distance of the fingers and toes. Ways of moving within this space are discovered. For instance, the child is asked to move one arm, then move the other arm, move one leg, move the other leg, and then finally move his head, keeping all these parts going at once. Or, he is asked to keep both hands on the floor and see how many ways he can move while in this position.

Next, space is extended somewhat and the child learns that space

has an "up" and a "down" when he climbs on chairs or desks and jumps off them. He discovers that space has an "over" and an "under" by jumping over some objects and crawling under others.

As a child's confidence improves and he gains more knowledge about his body, he learns some simple tumbling stunts. He also begins experimenting with new heights by climbing to the top of a ladder or hanging by his knees from a bar placed high above the ground.

At this point in the program, most of the children are capable of handling a short amount of free time at the end of each class period. This is an excellent time for the teacher to become an observer of each child's progress.

After six to eight weeks of movement exploration, some children will be ready to experiment with more advanced gymnastics. Included is tumbling as well as balance beam and trampoline.

The final result of such a program is not the same for every child. Individual differences in body build, attitude, and interest must be considered. However, the child will have been given the opportunity to develop the confidence and physical ability needed to participate in the games and sports which he enjoys the most.

FEDERAL PROGRAMS AND THEIR IMPLICATIONS

FOR THE VISUALLY HANDICAPPED

Dr. Douglas C. MacFarland, Chief
Division of Services to the Blind
Social & Rehabilitation Service

Department of Health, Education & Welfare
Washington, D. C.

As you know, it was originally planned that our Administrator, John Twiname, would speak to you. This is a particularly busy time for him, and therefore he could not be with you. I do want to bring you his greetings and tell you of his sincere interest in serving the blind and visually impaired and of his strong support for programs that will benefit them.

Vocational Rehabilitation is truly a State-Federal partnership, and therefore, our greatest effort and most of our half-billion dollar appropriation goes for supporting the basic programs in the States. The money is divided 80% Federal, 20% State. The State is responsible for provision of all services. These include, but are not limited to, physical restoration, diagnostic evaluation, counseling, rehabilitation adjustment services, pre-vocational training, vocational training, placement, and follow-up services. This is the vocational rehabilitation cycle.

It would be absolutely superfluous for most of you attending this convention to describe in detail any of the above mentioned services. You are familiar with them and in most instances provide a vital part of the continuum that ultimately leads to self-support or at the very least self-help and self-care.

The Act governing our administration provides service in many other areas that make it possible to carry out successfully the rehabilitation cycle noted above. For example, there are grants for the provision of services to States where such services are new to that State. The matching ratio here for the first three years is on the

basis of 90/10. The Act also authorizes construction money for workshops and rehabilitation facilities and grants to help staff such facilities. Technical assistance is provided through a panel of experts to assess current needs and provide consultation regarding improvements.

In the same portion of the Act money is made available for stipends to trainees who may need to undergo extensive training in workshops or similar facilities along with a small appropriation for contracts with industry. These are designed to increase the interest of large and small companies in the employment of severely disabled persons. Of course, many of you are familiar with our regulations which permit third party funding, designed to develop cooperative arrangements with other State agencies, hospitals, schools, etc., in order to extend vocational rehabilitation services in State agencies other than those directly concerned with vocational rehabilitation. The only requirement here is that the personnel be under the supervision of the funding agency even though physically housed elsewhere. Through this arrangement the concept of vocational rehabilitation has been substantially expanded in a number of States. Alabama, located in this region, is a fine example of how third party funding can be utilized to expand the State program and, consequently, services to disabled citizens.

Thus far we have been talking about portions of the Act dealing with services that are client centered. In order to carry out successfully a truly meaningful program to the handicapped of this country, it is essential not only to make services available to them, but to design mechanisms that will provide training for the specialized personnel needed in the program.

Research, Demonstration, and Training have been integral parts of our vocational rehabilitation program since the amendments to our Act of 1954. These revisions made it possible for us to inaugurate and maintain long-term training programs in medicine, psychology, social work, rehabilitation counseling, mobility instruction, rehabilitation teacher training, placement training for counselors working with the blind as well as many other disciplines. Through these grants, we are able to provide initial support for faculty as well as stipends for interested students.

A portion of the training money is set aside for short-term training programs, workshops and special training courses, usually a week or less in duration. Such programs acquaint employed personnel with new techniques in the field and afford an opportunity for

the exchange of ideas among professionals. The short-term training concept also permits the bringing together of experts in various fields to discuss new or expanded employment opportunities (in our case for the blind and severely visually impaired) and to develop guidelines and methods for opening new areas of vocational opportunity. Short-term training grants may be given to universities or non-profit organizations or agencies interested in the conduct of such training. The somewhat phenomenal growth of our program in the past 18 years would not have been possible without basic support from our research and demonstration programs. A great deal of money has been spent since the Act was broadened in 1954 to develop hardware, study and implement new teaching techniques, and to evaluate sociological change with respect to the effect of society on the blind and visually impaired and how positive attitudes can be cultivated and negative behavior modified.

The demonstration aspect of our program has had a profound effect on expanding services and introducing new techniques. Two fine examples of how demonstration money was used during the past decade and a half will suffice to illustrate my point. Although mobility training for the blind had proven its worth and had been demonstrated successfully at veterans centers and at our vocational rehabilitation facilities, it was still necessary to provide the initial support in a number of instances to encourage communities, including some residential schools for the blind, to provide full-time training. The second illustration was the establishment and initial support of optical aids clinics, of which 35 were developed over a ten-year period.

To round out our research and demonstration picture, I should like to include a brief comment concerning our International Division. Using excess currency generated by our Public Law 480 funds, we have for the past several years taken responsibility for the initiation of model rehabilitation programs in developing nations. The goals of the programs are simple. They are to introduce and to expand rehabilitation services to disabled persons wherever excess currencies are available to do so, and through these demonstrations to gain knowledge that is applicable here in the United States. These missions are being accomplished. In addition, we are gaining tremendous propaganda benefits that would not be possible in any other way. I am sure that you would agree that rehabilitation is the most positive way to extend goodwill and understanding to our world neighbors.

So much for vocational rehabilitation within the meaning of the

Act. The question remains, however, how has it been meaningful to blind and severely visually impaired citizens. Let me give you a few facts that are not highly publicized but will provide a measure of progress.

Of the estimated 437 thousand blind persons in the U. S. today, 105 thousand have been rehabilitated in accordance with our definition. 65,000 were rehabilitated into gainful employment. The remaining 40,000 were trained as housewives or unpaid family workers. Of the 65,000, 520 are employed as teachers of sighted children, 550 as computer programmers, 2,100 as medical transcribers. The remainder are in professional, managerial, clerical and sales, industrial (skilled, semi-skilled, unskilled), and sheltered workshop employment. The figures quoted above do not include the severely visually limited who have been rehabilitated but are not considered "legally blind."

On one hand this might be considered a rather impressive record. It is also a fact, however, that we have merely scratched the surface and with the rapidly changing economy, advance of technology, and continuous rearrangement of human resource priorities, we could easily suffer severe setbacks unless we redouble our efforts.

How do we in the vocational rehabilitation administration view the future? One measure of course is a current assessment of blind persons in training. At present, there are more than 3,000 blind persons attending colleges and universities. 2,500 are enrolled in commercial courses in business colleges, 2,000 are receiving training on the job or in specific trade schools. The statistic, however, that is of greatest interest to all of us is the 8,500 blind students now attending junior and senior high schools. Although we have always had excellent cooperation with both residential and public schools, much closer teamwork will be necessary to assure success for these young people. It is no longer a matter of lack of training facilities or opportunity, but the great need is for careful planning in order to fit into an increasingly complicated society. It is important to guide the student into a field which fits his abilities, is satisfying for him, and will have lasting benefits, rather than encouraging the youngster to follow the glamour trail. In spite of great social and economic changes which are occurring now and will continue in the future, opportunities will always be available for the well-trained blind or severely visually impaired person. However, we must train him in skills that will be needed tomorrow if we are to face up to reality and help the student do likewise. Such reality may be illustrated by

the fact that second best can earn a silver medal in school competition but won't earn bread in the world of work.

Thanks for letting me share some ideas with you. I hope that the sharing we had this morning and which was manifested at the conference can be expanded so we can build the strong bridges that are needed in all communities if we are to do the job expected of us by those we serve.

A DELIVERY OF COMPREHENSIVE SERVICES TO DEAF-BLIND CHILDREN AND THEIR FAMILIES THROUGH THE REGIONAL STRUCTURE

Dan Burns, Coordinator

Mid-Atlantic Regional Center for Deaf-Blind Children
Raleigh, North Carolina

There has been misunderstanding nationally regarding the term "deaf-blind." A review of the term now might be helpful. Under the provisions of P.L. 91-230, the Education of the Handicapped Act, services are offered *to children who have both auditory and visual impairments, the combination of which causes such severe communication and other developmental and educational problems that they cannot be accommodated in such education programs either for the hearing handicapped or for the visually handicapped child.*

Under the program of the National Center for Deaf-Blind Youths and Adults, services are offered *to youths and adults who have both substantial visual and hearing losses such that the combination of the two causes extreme difficulty in learning.*

The rubella epidemic of 1964-65 swept across this nation leaving an estimated 20,000 children with one or a combination of the following handicaps: Cataracts, heart malformations, hearing defects, mental retardation and brain damage. In addition to this group, another 20,000 pregnancies were terminated in miscarriage or stillbirth.

We estimate that there are 4,600 children who can be termed deaf-blind as a result of the 1964-65 rubella epidemic. In the Mid-Atlantic Region alone we have identified 406 deaf-blind children.

Two Programs for the Deaf-Blind in the United States, Guam, Puerto Rico and the Virgin Islands:

Two programs serve deaf-blind persons in the United States, Guam, Puerto Rico and the Virgin Islands. One is for children and the

other for youths and adults. The program for children is administered by the Bureau of Education for the Handicapped, the U. S. Office of Education. Under an agreement with the Social and Rehabilitation Administration, The National Center for Deaf-Blind Youth and Adults serves deaf-blind youth and adults.

Centers and Services for Deaf-Blind Children

Ten Regional Centers for Deaf-Blind Children, each headed by a regional coordinator, provide services for from five to seven states. These regions do not follow the boundaries of HEW regions, but represent a group of states that voluntarily agreed to form a region. One agency in each region agreed to take the responsibility for coordinating services and programs in the region. In some regions a state agency has the administrative responsibility and in others a private institution or agency is the administrating body.

Each center is responsible for establishing a register of deaf-blind children. From this information grows the programs and services which provide direct services to deaf-blind children, their families, and personnel working with them.

While understandably each region is unique because of differences in geography, population and services available, they offer to some degree the following services:

1. Evaluation and diagnosis
2. Residential programs
3. Day school programs
4. Home teaching
5. Parental guidance
6. In-service training
7. Respite care
8. Transportation
9. Coordinating of agencies

10. Research and sociological studies

11. Local, state, regional and national workshops

12. Survey and analyses of legislation and recommendations and support for new legislation

13. Coordination of colleges and universities to provide education for personnel working with deaf-blind children and their families and for parents

14. Information and referral services

15. Cooperation with colleges and universities in providing summer courses and short term courses for teachers, aides and parents

16. Summer programs for deaf-blind children and their families

17. Formation of and cooperation with parent groups

18. Public information

19. Locating and obtaining additional funds, i.e., Title VI-B, Occupational Education, Traineeship Grants, Private Sources

20. Cooperation with institutions to provide practicum for students

21. Recruitment of personnel

22. Maintaining a registry of deaf-blind children

23. Registry of agencies responsible for services to deaf-blind children and their families

24. Cooperation with National Center for Deaf-Blind Youths and Adults

25. Cooperation with all agencies that serve deaf-blind children

The National Center for Deaf-Blind Youths and Adults

The 1967 amendments to the Vocational Rehabilitation Act authorized the creation of the National Center for Deaf-Blind Youths

and Adults. The Center serves any deaf-blind person who is 21 years of age and younger persons who have made the fullest possible use of educational opportunities available to them and who might benefit from rehabilitation or habilitation.

The National Center was established over two years ago and is operated by the Industrial Home for the Blind, Long Island, New York. Its purposes are:

1. To provide rehabilitation or habilitation training for deaf-blind youths and adults based on their needs, interests and capacities.

2. To conduct research designed to minimize the handicapping effects of deafness and blindness.

3. To provide professional and technical training for personnel working with deaf-blind youths and adults.

4. To provide public information that will lead to the understanding of deaf-blindness.

Presently the Center is housed in temporary facilities, but will move to a specially designed, permanent headquarters on Long Island in about two years. This will allow for a major expansion of services. The National Center now operates three regional offices in Atlanta, Georgia; Chicago, Illinois; and Glendale, California. There are plans to increase the number of regional offices in the near future.

The staff of the regional offices assists state and local agencies in serving deaf-blind persons in their home communities when possible, and makes referrals to the National Center for a rehabilitation and training program when indicated.

Conclusion:

The Regional Centers for Deaf-Blind Children and the National Center for Deaf-Blind Youths and Adults are cooperating in an effort to provide an uninterrupted continuum of special education and rehabilitation program for deaf-blind children, youths and adults. Together they seek the cooperation of all individuals and agencies serving this population.

DIAGNOSTIC SERVICES AND PROGRAMMING FOR DEAF-BLIND CHILDREN

York Hudgins

Director, Georgia Center for the Multi-Handicapped &
Consultant, Visually Impaired, DeKalb County Board of Education
Atlanta, Georgia

Picture for yourself a little girl, named Sherry, very typical in appearance and in physical, neurological, and mental abnormalities of rubella syndrome children. She is now 7 years 2 months old. Her appearance has not changed significantly in the last year and 10 months. She has gained some weight and made developmental gains. She and her parents have a lifetime of problems, but these don't appear as unsurmountable as they did 2-3 years ago. The main thing going for her now and some 80-90 children in Georgia very similar to her is that she has someone besides her parents concerned and providing support to see that she makes maximal progress. Three years ago, she would have been relegated to a state institution for *custodial* care, likely for the remainder of her life. Today she is in the deaf-blind developmental training-educational program at the Georgia Academy for the Blind.

Sherry's management, developmental, and subsequent training or educational problems can be attributed to rubella in utero or maternal rubella. The epidemic of 1964-65 produced approximately 30,000 rubella syndrome children. Another 20,000 were stillbirths or died in early infancy. Medical science has determined that virtually every organ may be affected by congenital rubella with the most typical anomalies being deafness (in varying degrees), congenital heart disease, blindness (in varying degrees), and mental retardation, again in varying degrees. A rubella syndrome child might have any one or a combination of these conditions.

I remember quite vividly, as many of you do, our biennial convention in Toronto, Canada, in 1968, when Dr. Louis Cooper presented a most effective slide presentation and gave a very frank and factual discussion of the medical and educational implications for rubella syndrome children. At that time, I think I breathed a sigh of

relief that my "bag" was the education of blind children, and not involvement with these pathetic creatures. I didn't dream that a short year and one half later, I would be devoting my full professional energies to their welfare.

In December, 1969, I accepted the challenge of developing a comprehensive diagnostic evaluation center for deaf-blind children in Georgia. This program has become a reality beyond my greatest expectations. We provide the comprehensive work-up that is needed to determine how a severely involved multihandicapped child is functioning, but we go far beyond the diagnosis and recommendation. One of the unique aspects of our program is the follow-through we are able to provide for the children and their parents. If we bring children in for a two to six weeks educational, psychological and medical evaluation, and the child returns home to regress to a former state, then we have done nothing. If the final report goes to a community agency where it's scanned and filed away, then we have done little more than spend the citizens' money. *But* we have *done something* worthwhile when a child, after evaluation, is placed in a program which meets his immediate developmental or educational needs.

Now back to Sherry. Like a large percentage of rubella syndrome children, she came to our center quite emaciated. Upon entrance she weighed 24 pounds. At the time of her discharge, almost two months later, she still weighed 24 pounds. The mean weight for a 5 year old female is 42 pounds. This 18 pound difference is quite significant for a five year old. Her arms and legs, as her entire body, were quite spindly and frail. She was a listless child without apparent strength and energy for active involvement with peers or the environment. In her developmental history there were definite periods of apparent lack of appetite and generally a failure to thrive.

Sherry was not weaned from the bottle; she was consuming regular table foods which had been blenderized and which she took from the bottle. She could not eat solids as she had difficulty swallowing and she would not chew. These characteristics, the failure to thrive and difficulty swallowing and chewing, also are typical of many rubella syndrome children.

Sherry had a cardiac problem diagnosed as patent ductus arteriosus. This presented no problem from a training and educational standpoint.

Sherry had bilateral congenital cataracts, postoperative. Even after the operations there continued to be a clouding of both pupils. Glasses were not prescribed to replace the removed lenses because, in her case, she was functioning at such a low developmental level that she could not wear them appropriately.

She demonstrated no functional hearing. Whether or not this was due to a profound bilateral nearing loss or whether her problem was a central nervous system disorder was not easy to determine. She could not be conditioned to respond to auditory stimulation in a traditional manner. It was necessary for the audiologist to look for reflex action and startle responses. For all practical purposes, however, she functioned as a profoundly deaf child. Naturally, she had no meaningful communication system beyond laughing and crying.

Sherry was not toilet trained and showed no discomfort when soiled. She, unlike many rubella children we see, had some ambulation. This was by crawling and sliding across the floor. She could not walk, and initially could not support her weight without assistance.

Other more involved children have had absolutely no ambulation and cannot muster sufficient strength to even sit without support. Some have demonstrated bizarre ambulation through surpine crawling, i.e., scooting across the floor on their backs.

Some were constant light gazers and appeared to derive their greatest satisfaction from flicking their fingers directly in front of their eyes and engaging in other perseverative mannerisms for self-stimulation.

I believe it goes without saying that many of these children were functioning at a level of severe to profound mental retardation.

Although Sherry was quite delayed physically as well as developmentally, our consultants and staff saw enough developmental gains to provide us with what I believe is some realistic hope. While in the program she began relating to objects and people in a meaningful way and her attention span increased. She made improvement in ambulation to the extent that she could walk for long periods while holding someone's hand. She progressed from blenderized foods to some table foods and could assist with spoon feeding. She learned to drink from a cup.

Sherry's placement is appropriate for her for the present. She

might never make sufficient educational gains to justify a long-term educational program, and one day, she might be placed in a state institution. Even if this is the case, the time, energy, and money expended in her behalf will have been well spent. As a result of early diagnosis and training, she will be ambulatory, she will be a self-feeder, and she will be able to care for her own personal needs, and she will have developed the basis for a communication system. I predict she will make even more progress than this. It is still much too early to rule out the possibility that she will make sufficient progress to become a contributing member of society.

As I stated earlier, our program began operation in late 1969. By June, 1971, we felt we had worked with and programmed for most of the severely involved rubella deaf-blind children. At that time we altered the criteria for acceptance into our program to include children 12 years of age or younger who have a major sensory deficit, that is, deafness or blindness, in combination with other handicapping conditions. But even at this time, we infrequently learn of, and work with, a deaf-blind child who is a product of the epidemic of 1964-65.

Our diagnostic program is available at no cost to children of our state due to the fact that our most substantial funding comes from Federal sources. Our center's operation is a joint endeavor of the DeKalb County, Georgia, School System; Elks Aidmore Hospital, which is a convalescent and rehabilitation hospital; the Department of Special Education, Georgia State Department of Education; and the Southeast Regional Center for Deaf-Blind Children.

I might add at this point, and I don't hesitate doing it since this is a convention of educators and others concerned with the welfare of the blind, you are doing a heck of a lot more for your multi-handicapped population than many others working in the field of special education. I believe most of us (and I include myself with you) are subscribing to the philosophy of serving children - all children - rather than handicapping conditions.

Let me say in closing that we have been fortunate in bringing together quite a team of educational, psychological, medical, and social service professionals in order to accomplish our major goals - these being the identification of the population; providing medical, psychological, and educational diagnosis; parental counseling; and appropriate placement of children served.

DEVELOPING A VOCATIONAL PROGRAM IN A RESIDENTIAL SCHOOL FOR THE BLIND

D. Gary Coker, Principal

Tennessee School for the Blind
Donelson, Tennessee

There is one purpose for vocational education and that is turning out graduates who can perform effectively on a job. You can have the most elaborate curriculum, the most dynamic instructor and go through all the motions of teaching but if the students can't perform on the job, the program is a failure.

One of the first developmental steps for a school is to decide what approach to vocational education it will take: (1) provide technical training so that students have a salable skill; (2) provide work experience background so he can improve his skill through further practice; (3) or a combination of skills and experience. What is best for one school is not necessarily good for all.

In Tennessee, we choose to take both approaches. In the area of technical training, we offer office occupations which consists of five years of typing, two years of bookkeeping, filing and general office work, and one year of general business. In industrial arts, we offer two years of advanced work in radio electronics, metals, and woodworking; and four years of piano tuning. These courses are designed to allow the student to go from the classroom to on-the-job training.

The second phase of our program is work experience. Juniors, seniors, and special students may attend regular classes in the morning and work in the afternoon. This program is designed to allow the student to work a minimum of 15 hours a week. In all instances, placement has been off campus with normal working conditions.

I want to share with you some of the successes and failures

involved in developing the two areas I have mentioned. I think of any curriculum program in three phases: (1) preparation, (2) development, (3) improvement. In the preparation phases (after you have the money) you set up course objectives. In skill areas, these objectives are based on task analysis. In work experience these objectives are based on general knowledge, applications, resumes, interviews, employee relations, etc. Your objectives should be stated with behavioral outcomes, i.e., what kind of things should the student be able to do at the end of a course. Even for students enrolled in a work experience program, it is important to have at least one class period a day with the teacher.

Another thing to be considered in your preparation is who is going to be allowed to enter the course. What about pre-requisites, course work, age, academic achievement, etc. The fewer the restrictions, the larger the number and the greater the need for individualized instruction. In skilled areas, there are definite pre-requisites. For example, we suggest that for office occupations, the student should have successfully concluded two full years of typing and general business. To enroll in industrial arts, a sequence beginning with general industrial arts to the third year of specialization is required. Pre-requisites for work experience are limited to basics that deal with work laws such as age, etc. We do not set up academic achievement as a pre-requisite. This allows the student who may be having difficulty in the academics to be successful in cooperative education. We have found that the local Junior Achievement organization provides an excellent pre-requisite for students in cooperative education.

Once you have completed the preparational phase, you develop the curriculum. Here you outline instructional units in terms of specific tasks. At the end of each unit, the student should be able to do something that he couldn't do before.

It is important that during the development process, a job-oriented point of view is adopted. This keeps the subject matter relevant.

During the development stages, determine job availability and do task analysis. Locate employers and make a job analysis of what is required, its importance, its learning difficulty. Then match the student and the job. Forget numbers! Don't place students for the sake of placement.

The task analysis helps the teacher to individualize instruction

and avoids a lot of irrelevant content.

The development of a program must include various types of performance or instructional procedures for reaching your objectives. Here we see a great deal of diversification, but all moving toward the same objective. Some will use simulated work experience that may be sub-contracted and is done on campus. Others may have on-campus jobs or controlled workshops. The approach must be determined by the population with which you are working. These approaches are what I call instructional procedures. But our success is still determined by the student who is gainfully employed.

The third phase of developing a program is what I call improvement. A course should be as up to date as a morning newspaper. This phase is probably the simplest to check but one of the most critical. All too often we have a student on the job and feel we have completed our task. There are two important aspects in this phase. The first involves checking student performance against the objectives and secondly, checking the objectives against the job. When a student is enrolled in classes, evaluation techniques are readily available. However, after he leaves, continue to check on his progress. Call him on the phone, send a questionnaire, talk with his supervisor. Go back to your job analysis and ask specific questions. To answer the question "how's he doing" doesn't require much analysis.

In Tennessee this past year, we had the following breakdown of placements:

Total wages earned by all students	$2,621.40
Total hours worked by all students	2,291
Total students placed for work experience and diagnostic evaluation	18
Placements	
Child care aides	5
Restaurant food service	9
Piano tuning	2
Transcriptionists	2
Highest wage/hour earned at end of year	1.95
Lowest wage/hour earned at end of year	1.60
Students enrolled in permanent vocational work experience - average wage earned	1.70

We also had four students that were not employed. We have had three to be dismissed.

In summary, I would like to say that vocational education is not a panacea but it does offer a great deal of opportunity for students if well planned. In small schools, it will cause schedule difficulties, especially in residential schools who have athletic and music programs occurring in the afternoons. Let's explore job opportunities that are not traditionally thought of in the area for employment of the visually handicapped. We know students can be successful in vending stands, piano tuning, etc. Let's get out and do some job analysis, set up curricula with objectives based on these analyses and use whatever instructional methods necessary to get the student on the job. Don't bore the student in the classroom with irrelevant facts. After you've done all these things, smile, work and pray, and I'm sure the program will be successful.

"GIVE A MAN A FISH AND HE CAN EAT FOR A DAY. TEACH HIM HOW TO FISH AND HE CAN EAT FOR THE REST OF HIS DAYS."

Isaac D. Clayton, Coordinator
Work-Study & Work-Experience Programs

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In any local economy, new industries emerge; some grow, others die. As a result, the occupational composition and skill requirements of the work force change through the years and past manpower needs are an uncertain guide to future requirements. Extensive projections of these changing manpower requirements are needed to ensure proper planning of vocational education programs and training facilities.

No single acceptable methodology exists to predict employment needs by occupation. Some of the principal methods used are employer surveys, job opening data, and industrial employment trends.

Already existing studies did not provide concrete evidence that could serve as a total basis for developing Vocational Education Program projects appropriate for the blind and partially-sighted. Therefore, from March 1 through August 31, 1972, under a grant from the Maryland Department of Education, Division of Vocational and Technical Education, the Maryland School for the Blind is conducting a survey to: (1) determine occupational opportunities for the blind and partially-sighted in the State of Maryland, (2) determine the employment history and present job placement of visually impaired adults who attended the Maryland School for the Blind from 1951 through 1971, and (3) develop a pilot Vocational Education Program in accordance with the findings in "1" and "2" above.

The content of this paper should be assessed in the light of the history and current status of vocational education curricula in schools for the blind at the national and local level.

In an effort to ascertain the current trend in industrial arts and vocational education programs in residential schools for the blind, the writer developed a questionnaire seeking information regarding said programs; the questionnaire was sent to the 44 residential schools in the United States.

Tables 1 and 2 on the following pages attest to the sobering state of our pre-vocational and vocational programs in terms of truly preparing the visually impaired student for the world of work.

Over the years, vocational and technical education has increased on a very limited scale in schools for blind children, as compared with quite extensive development in the public schools. The range and quality of opportunities in vocational education programs for the blind has not kept pace in curricula or physical facilities. It is reasonable to assume this lack is due to reliance upon the post-graduate experiences which students have under the auspices of public agencies charged with this responsibility. The opportunity of receiving post-graduate training or schooling, however, seems to be available only to a select few. Generally, those blind students with a higher capacity for learning (20% to 40%) are the ones who do, and rightfully so, receive the bulk of advanced education and training. However, this is serving the needs of the minority, and it is time that educators of the blind also serve the dire needs of the less able majority through realistic vocational education programs that will provide visually impaired children opportunities for training and employment in suitable and satisfying occupations.

Many educators of the blind have recently shown an upsurge of interest in the less intellectually endowed majority of their school enrollment because of (1) the growing belief that everyone is entitled to use his abilities--whatever they may be--in a productive way, and (2) the cost of dependency as compared with self-sufficiency.

Too often, vocational educational programs in schools for the blind have been predicated upon an already established and saturated labor market; we have been remiss in exploring new avenues of occupational training and placement.

The problem is four-fold: (1) Planning and making occupational projections as identified by the various labor market projection methods, (2) establishing appropriate vocational education facilities for blind school age children, (3) developing realistic vocational education programs for blind children that will

TABLE I

School No.	Enrollment	Pre-Voc. & I Program		Maximum Participants	College Bound
		M	F		
1	181	33	21	60	25%
2					
3	174	15	12	40	60%
4	140	8	8	?	33%
5	86	4	8		55%
6	140	20	18	0	33-1/3%
7	207	70	50	150	20%
8	185	26	3	45	25%
9	31	9	7		
10	43	0	0	0	0
11	165	60	30	100	50%
12	112	23	6	40	20%
13	85	22	-	30	40%
14	133	35	5	42	40%
15	122	35	10	60	10%
16	110	20	3	45	60%
17	277	11	24	277	50%
18					
19	277	89	63	177	23%
20	79	23	22	59	0
21	90	20		35	20%
22	198	28	0	35	50%
23	168	12	12	-	5%
24	186	55	40	100	65%
25					
26					
27					
28	163	27	24	31	75%
29	342	102	77	200	31%
30	33	6	0	33	
31	171	56	46	109	25.3%
32	124	36	27	63	35%
33					
34	260	40	10	60	30%
35	195	-	-	?	20%
36	165	46	37	83	Unknown
37	43	12	-	12	10%
38	185	54	24	120	65%
39	266	75	20	130	40%
40	67	8	11	19	0
41	104	27	11	52	30%
42	133	36	33	69	40%
43	135	28	20	100	40%
44	110	33	33	170	45%
45	153	45	40	100	55%
Total	5838	1249 (21%)	755 (12%)	2646	

TABLE II

School No.	Specific Occupation	Salable Skills	Hobby	Limited Skill Development	Attend Local Voc. Tech	Exploratory
1	X		X	X	9	
2		X		X	0	X
3	X	X	X	X	0	X
4		X			9	X
5		X	X		1	X
6		X		X	0	
7		X		X	10	X
8						
9			X		0	
10			X		0	X
11						
12						
13				X	0	
14						
15						
16				X		X
17	X	X	X	X		X
18	X		X	X	0	X
19						
20						X
21	X		X	X	0	X
22		X		X	0	X
23						
24		X		X		X
25		X		X	0	X
26			X	X		X
27		X	X	X	0	X
28			X	X		X
29						
30		X		X	6	
31						
32						
33						
34		X			0	X
35	X	X		X	0	X
36		X		X	0	X
37						
38		X				X
39	X	X	X	X	-	X
40		X	X	X	-	X
41	X	X		X	110	X
42		X	X	X	0	X
43						
44						X
45	X	X	X	X	0	
Total	9	21	15	24	145	26

better equip them for employment in today's and tomorrow's competitive and/or sheltered labor market, and (4) diminishing the existing pre-vocational gap between the school and other agencies charged with post-school training and eventual placement.

Recent surveys at the Maryland School for the Blind and other schools for the blind (Dauwalder, D. D., Education Training and Employment of the Blind, 1964, p. 68) indicate the need for effecting complete vocational education programs and developing the necessary physical facilities for their implementation. The statistics indicate that 60% to 80% of the students are not endowed with college ability. This, coupled with the growing number of multiple-handicapped blind children reaching school age each year (currently more than one-third of the enrollment at the Maryland School for the Blind fall into this category), vividly outlines the magnitude of the problem.

DESCRIPTION OF ACTIVITIES

1. A questionnaire will be sent to 2,000 selected employers in the State of Maryland.

   The questionnaire will be validated by personal interviews with a randomized selection of the respondents, both positive and negative, and will be tabulated by areas to provide the data for correlation purposes.

   Further validation will be provided by relating results of this survey with information available from Maryland State Departments of Employment Security.

2. A questionnaire will be sent to former students who attended the Maryland School for the Blind from 1951 through 1971 and followed up with personal interviews where necessary.

3. Appropriate statistical analysis of the data will be performed to test the null hypotheses stated above.

4. Educational curricula will be designed for Pilot Vocational Education Programs as indicated by the results of steps 1 through 3.

USE TO BE MADE OF FINDINGS

1. The results of this study will be used to establish realistic

and meaningful vocational education curricula at the Maryland School for the Blind based on the salable skills which need to be developed to meet the requirements of the current and projected labor market.

2. The results will be disseminated and published in order to provide other vocational education programs for the blind with the occupational information, most of which is *not* available from any other source.

3. Although this study is limited by design to the Maryland School for the Blind, it will have considerable applicability to other metropolitan areas and will indicate the methods by which similar surveys could be developed.

4. The results of this study will have general educational significance; as a method for relating particular vocational education problems to occupational opportunities.

5. The results will be used in making appropriate changes in the existing Maryland School for the Blind vocational program.

GUIDANCE: FOR WHOM? FOR WHAT? BY WHOM? HOW?

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There is a story told about a woman who entered the hospital. She needed an appendectomy; she got a hysterectomy; but what she really wanted was a facelift. The story undoubtedly illustrates the status of many recipients of guidance and rehabilitation services today. Many get what they don't really need; others get what they don't want; still others don't want what they really need and may or may not get.

This is an age of accountability for the delivery of services. The delivery system must demonstrate that its services are needed and wanted by the recipients and furthermore, that the services rendered are effective within stated goals and objectives. On-going evaluation of the entire delivery system is essential to arrive at this determination. Within this context, therefore, it may be well to review school guidance services from the point of view of for whom are services offered, to what end, who should render them, and how should they be delivered.

It goes without saying that most guidance personnel would agree that their services are and should be given in appropriate quality and quantity to students. This is an ideal that is probably far from reality. Wilhelmi (1970) found in his study that blind subjects with a higher level of intelligence received the greater amount of money and the greater degree of counseling during their rehabilitation. As a matter of fact, for his lowest group, subjects with a measured I.Q. 50 to 84, there was a negative correlation between degree of counseling and all three criterion variables which he used for determining vocational success, namely, income earned, percentage of time worked since completing school, and socio-economic status. The negative correlation with earned income was significant at the .05 level. For the total population

he used in his study there was almost no relationship between counseling and any of the criterion variables used for vocational success. When the amount of money spent on a client was used as a measure related to degree of counseling, it was found to be a significant predictor variable only for his second group of subjects, that is, those with measured I.Q.s between 84 and 100.

It is always difficult to generalize from research completed on one group to a total population. However, some of these findings raise some interesting questions. Do counselors tend to spend their time, financial resources and energy on the upper intellectual group who may not really need their services in order to succeed? Are counselors giving the wrong kind of service to the clients who have a lower level of intelligence, so that such counseling may actually interfere with the rehabilitation process? Are clients across the board given the same "treatment" when in reality there should be some differentiation and variation of counseling?

If we are to attain the objective of giving service to all, we need to develop a variety of delivery systems in order that each is given what he needs to the degree that he needs it. The same mixture of services may not be appropriate for all in equal measure.

Changing societal conditions raise many questions regarding the purposes of counseling, that is, to what vocational goals are we directing students. It was estimated some years ago that the average person changes occupations at least three times during his working life. This figure probably needs to be revised upward in the light of the increasing number of occupations that are becoming obsolete. An illustration from our own field lies in the excitement and flurry with which blind persons were steered into computer programming. Now, a few years later, some are having difficulty getting jobs and the future of the occupation is presently in doubt. For whatever field we are guiding young persons to consider as a vocational possibility, we, as well as they, need to understand that the possibility exists that they may not be able to pursue that career for their entire working life. This calls into question the practice of training for specific jobs. It is undoubtedly questionable to direct efforts in a specific direction; instead, emphasis should be placed on broad general training that may transfer to the specific.

It is estimated that there are presently approximately 3000

visually handicapped students in colleges and universities across the country. With the changing job market and the impossibility of many current college graduates to obtain employment commensurate with their level of training, one wonders what kind of guidance and counseling these 3000 students have had or are getting. Naturally, one may ask the same question regarding the thousands of normal young people who are in college too. But the question becomes somewhat more critical when dealing with a handicapped population. In times past, the handicapped person and those from minority groups needed more training in order to get a job. This generalization may not be appropriate at the present time when employers are looking for those with lesser training so that they do not need to pay them on a higher salary level. Our studies (Scholl et al., 1969; Bast, 1971; Wilhelmi, 1970) all found that under-employment relative to training is a common characteristic of the employed population among the blind. Indeed Wilhelmi (1970) found that with brighter subjects additional training did not contribute to greater success as measured by his criterion variables.

At least two questions come to mind regarding this aspect of guidance. Will anyone in the future be able to obtain *the* job he wants? Will everyone be able to get a job? Several years ago I raised the question of whether it is realistic for us to prepare our handicapped population to look forward to job placement. It would seem from a review of present societal conditions that employment may not be a feasible objective for our entire population whether they are handicapped or not. If this be true or possible, then the emphasis in educational programs must change in order to prepare students for satisfying and productive living in an unemployed setting. In addition, the question of obtaining a job commensurate with abilities arises. It may be more reasonable to emphasize in educational programs those aspects of education which will broaden life's experiences apart from the job. In such an instance, individuals should receive help in identifying activities which will make life away from the job meaningful and interesting to compensate for the eight hours spent on the job that are routine and dull. There still seems to be a shortage of workers in the technical and service occupations. However, many of these are routine and not challenging in and of themselves. Perhaps job training should include instruction on how to survive a dull job by having an interesting life away from the job. All of these observations would seem to suggest that satisfaction of doing a job well and/or devoting one's entire life to a particular job is outmoded. These may be questions and issues which should be discussed and well thought through as we are planning educational programs for the future.

Many of the foregoing issues are related to the question of who should be doing the counseling. Bast (1971) found that when interagency cooperation was instituted, successful placement of clients was achieved even when all factors, including potential of the clients, seemed to point in the direction of lack of success. Is the task of guidance and counseling too large to be performed by any one person within the educational setting? It is possible that those engaged in such an activity within a specific school may be setting their sights on too narrow a range of occupational choices due, not to their own inadequacy, but to the impossibility of knowing about everything in this day and age. In addition, perhaps some are setting goals too high for some students and too low for others so that reality is not taken into account. In reviewing records for our study (Scholl et al., 1969) we found for some clients an unusual number of case closures followed by reopenings within a short period of time. In addition, many clients were placed in one training program after another, usually totally unrelated to each other. This may indicate a tendency to recommend a training program at a particular moment that seems to look good without giving thought to whether this really meets the needs of the client or whether he really wants that kind of training. Certainly, the recent experience in computer programming would support this possibility. It is necessary to be reality-based and at the same time mindful of the needs and capacities of clients.

The success of any one individual is dependent upon the efforts of numerous professionals working in a team approach in helping him solve his problems. The time has passed when a guidance counselor can work in isolation in a school setting without also taking into account the contributions which teachers, houseparents, parents, and other agency personnel may make in order to assist the visually handicapped student. In addition, the knowledges and skills of other professionals are needed. Current study and assessment of what is going on in the world of business and industry are also absolutely essential.

We turn now to the "how." Studies in work for the blind (Bast, 1971: Scholl et al., 1969), as well as those in other fields, stress the importance of self-concept in success, whether this be academic or vocational. This implies that there must be an assessment of personality characteristics and an intervention program undertaken very early in the child's life, beginning with parent education during the pre-school years. Many experiences in the "real" world must also be provided since contact with the normal is essential in order to arrive at a realistic appraisal of one's

own abilities. Bast (1971) found that his employed group had the following personality characteristics: more permissive, accepting, open-minded, less authoritarian and self-centered. He suggests that certain personality traits may contribute to vocational success to a greater degree than overall "good adjustment." The blind beggar as described by Scott (1969) may be well adjusted but may lack the necessary personality characteristics in order to be successfully employed, according to our definition. More specific personality assessment and programs of intervention should be utilized in preparing students for potential employment.

An important aspect of the "how" must also include attention to the increasing need for the team approach. Compartmentalizing certain functions within a school or within a delivery system, which includes schools and various social agencies, cannot meet an objective of working together on the common objective. School and agency personnel must be in constant communication if this objective is to be reached.

Another important aspect of the "how" is the increasing necessity of involving the student as well as his parents, when appropriate, in the total process. The age of decision-making apart from the person involved is over as, increasingly, individuals are demanding that they be heard and be involved in the process. When this comes about, there will be different practices in record-keeping as well as different procedures for evaluation.

Finally, as accountability is emphasized, an appropriate method for measuring outcomes must be developed. A case closure followed by a reopening a year or two later is not a success. Perhaps what is needed is a continuing system of follow-up that includes retraining when and as necessary throughout an individual's working life.

In closing, we might return to the beginning story and apply its principles to what should be done with regard to the delivery of guidance services. Efforts should be directed toward helping students know what they want by continuing exposure to reality. Then a delivery system should be planned to help them get what they need in order for them to attain what they want. The practice of giving what the delivery system determines is needed, regardless of what the actual need or want at a particular time may be, is doomed to failure as we move into an era of accountability and client involvement in the delivery of services.

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INTRODUCTION TO SECTION ON LOW VISION

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For nearly fifty years the low vision child who happened to live outside the large city school systems which offered "sight saving" classes, or who was unable to achieve academically even though enrolled in "sight saving" was referred to a school for the blind for placement. Here he frequently was a misfit because of the emphasis placed on braille, and was often a discipline problem because he saw enough to get into trouble and usually was an instigator of various kinds of disobedience in the school or dormitory. By World War II many schools for the blind as well as public schools were operating classes specifically for those children who used print, although there was a common tendency to restrict enrollment to those whose visual acuity was greater than 20/200. These classes also became available somewhat later for those who used low vision aids, and today are being used for low vision stimulation activities.

The concept that any degree of vision should be viewed as an asset to the child and encouraged rather than stifled was largely the result of crusading by Doctor Gerald Fonda, ophthalmologist, of New Jersey, whose position was reinforced by the low vision aid movement. It was not until the 1960s and the pioneering of Doctor Natalie Barraga that a formal educational program leading to improvement of visual functioning in children with low distance vision was developed and presented.

The position of the AEVH workshop that is concerned with low vision is that the child who enters our schools with any degree of vision deserves the right to develop that vision to the fullest potential. If the schools subscribe to this philosophy, what will be the implications for admission, for educational programming and curriculum, for instructional, as well as ancillary personnel, for

dormitory and recreational management, for facilities, equipment, and materials?

The following papers provide some perspectives from which to view this problem.

LOW VISION TRAINING - IMPLICATIONS FOR TEACHER PREPARATION AND PROFESSIONAL DEVELOPMENT

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The trouble with education is . . .

The line above might be followed by one or more of several hundred critical statements most of which are probably true, to some extent. I should like to modify the preface slightly, and then finish the statement by saying:

The trouble with *teacher* education is that the program content is primarily philosophy-based rather than objective-based. Furthermore, teacher training is characterized by a heavy emphasis on didactic teaching and vicarious experiences. Permit me to cite an example from my own experience.

STEC

At the University of Virginia we have what we believe is a pretty fair program for training teachers of exceptional children. In keeping with a national trend toward removal of categorical labels, and in order, hopefully, to make our program more comprehensive and efficient, we decided to explore the possibility of merging the first educational methods courses in the areas of Emotionally Disturbed, Mental Retardation, Learning Disabilities, and Visually Impaired.

We found a great deal of content in common, such as learning theory, diagnostic testing procedures, perceptual-motor development, developing instructional objectives, parent counseling, and language development. So we decided to schedule the courses in the same time slot and team-teach them under the acronym, *STEC: Strategies for Teaching Exceptional Children*.

Topics were selected, with each of the four faculty members taking a fair portion of the class sessions to make presentations on the areas in which each felt most competent. Following each presentation we divided into our specific interest groups and had seminar sessions in which we related the topics of the day to our own area (ED, LD, MR, or VI). Of course, each topic had relevant reading assignments by which the students were to prepare for the upcoming presentation.

We started the semester with Learning Theory, specifically with emphasis on contrasting the humanistic and behavioristic approaches. In the fall of 1971, Skinner's *Beyond Freedom and Dignity* had just been published and was being widely discussed. In addition we had just finished an orientation period for new students which included two days of lightweight sensitivity training. The results of this beginning for STEC were rather exciting, and quite stimulating. However, by the end of the first month, after we had moved into the specifics of teaching strategies, the students became restless and we reaped some of the results of the sensitivity training. That is to say, with only a small amount of encouragement the students expressed their feelings about the course. Most of the students felt intellectually stimulated, but were confused as to what was expected, what they were supposed to get from the situation that could be applied with children. Most of their comments were negative, but constructive. They, for the most part, felt the idea of STEC was OK, but were having trouble relating the content to their own specific areas of interest. We had related practicum experiences, but apparently these were inadequately coordinated.

There is not time to describe the action we took to resolve the problem, but we feel that with the help of the students we made some definite improvements in the course as we went along. My point is this: We developed the course on the philosophical position that most of the content of all of our beginning methods courses was based upon concepts which the various areas had in common, but which needed to be applied in different ways, depending on each child's condition. I think this was a good, valid, and even progressive idea. Our problem was that *we failed to decide at the*

outset the specific behaviors we expected to see in our students after each experience and at the end of the course. We neglected to do the very thing we had been telling our students to do, that is, to express our outcomes in specific, observable, behavioral terms. As might be expected, this omission did not escape the attention of our students. I don't think this was a unique or isolated experience. On the contrary, I think that this is a common characteristic of teacher training programs. May I say, it is all too common throughout education? Look at your own course of study. How often do your objectives begin with "To understand...," "To *really* understand...," "To appreciate..."? How can you tell when these objectives have been achieved?

In-Service Training

Most of the in-service training with which I have had experience as a teacher and administrator has been similar to our STEC program at Virginia in that it was based primarily upon considerations other than behavioral objectives. More importantly, emphasis has been on didactic teaching and vicarious experiences. Those few experiences which stand out in my memory as the most valuable were characterized by some amount of direct involvement, with clearly understood behavioral goals. However, most in-service training programs in my experience had about as much effect on the behavior of teachers as the appearance of a political candidate on prime time TV has on a group of teenagers. At best they ignored it, at worst they turned it off. After enduring lectures, discussions, movies, slides, and many coffee breaks, even perhaps a cocktail party or two, everyone went back to work at the same old job, same old problems, same old teaching behavior.

Since a teacher's sole reason for existence (professionally, of course) is to modify people's behavior, those of us in the business of training teachers ought to have specific behavioral objectives as the desired outcome for every course, every in-service training workshop, even for every class session. Behavioral objectives for students provide the ultimate criteria for evaluation of teacher effectiveness, for college professors as well as for classroom teachers.

Training in Utilization of Low Vision

Two years ago a number of us were involved in an exercise in skill dissemination which was carried out under the stimulation of the U.S. Office of Education. This was the series of special study

institutes on utilization of low vision. The goal was to develop in teachers the skills of assessment of visual efficiency and of training children to make more efficient use of low vision, with the assumption that the teachers would then use these skills to help their pupils. The goal was behavioral, at least in concept, and the skills had been validated through research. Thus the blessings of research would at last be translated into practice and a brilliant shaft of the light of knowledge would pierce the darkness of ignorance.

I had the pleasure of participating in four of these special study institutes, once as a participant, once as a staff member, and twice as director. After all this, I think I'm finally beginning to get the hang of it. Until I tried teaching the subject matter to my own graduate students this past year, there was no evidence before me that our efforts had been successful. Informal inquiries made of administrators whose teachers had participated in the institutes, and direct contacts with some of the actual participants, indicated that in many cases the skills taught were not being used. However, after teaching the theory and the techniques, and providing some supervised practice in administering the visual efficiency scale and using the results in planning training programs, I was delighted to see a real change in my own students' behavior. When they hit the practicum trail in the spring, they were administering the Visual Efficiency Measure all over the place, making profiles, and planning vision stimulation programs for individual students. In contrast to many of the teachers who had been exposed to the short term special study institutes, these graduate students, who had had no more hours of training, were really using the skills.

I hadn't really changed the format much from that which we used in some of the institutes. What I *did* do was change the proportions of time allotted to certain activities. About 20 per cent of the time was devoted to lectures, class discussion, and explanation; about 30 per cent was spent in viewing demonstrations of test administration, profile plotting, and remedial activity development; and 50 per cent of the time was spent in supervised administration of the Visual Efficiency Measure and the relevant activities that followed it. If I could have increased the total time to be spent on training in this area, all of the increase would have been devoted to supervised application and evaluation.

I would like to suggest the following hypothesis: When objectives of training programs are constructed on the basis of the specific behavioral consequences desired, and when the programs themselves

provide an opportunity for trainees to have direct experience, performance evaluation, and help in correcting problems, the desired behaviors are more easily established, and probably will continue after the training period ends. With the special study institute as a series of successive approximations of our own desired behavior, those of us who taught in the institutes have confirmed (not developed or created, because they are not new) a few basic principles for in-service training generally:

1. Express objectives in specific, observable, behavioral terms, and make certain that trainees know what they are. For example, one objective of an institute might be: "At the conclusion of the institute each participant will administer the Visual Efficiency Measure to a visually impaired child within a total administration time of fifty minutes or less." This statement is behavioral, and the time limit provides a criterion for acceptable performance.

2. For each in-service program, narrowly limit the topic and the range of behaviors expected. If the topic is assessment and training for utilization of low vision, don't take six hours of an 18 hour workshop with a cram course on the structure of the eye, human growth and development, or theories of perception. If the participants don't already know this, you aren't going to teach it in six hours, but the broadening and dilution of the subject matter may seriously jeopardize the success of the workshop in changing the behavior of the participants.

3. Severely limit vicarious experiences, especially lectures. A little of this goes a long way. At least use a variety of media for vicarious experiences to keep people awake until the fun starts.

4. Place *heavy* emphasis on practical application of the behavior to be learned, and provide adequate feedback so that performance can be improved. Opportunity for application sometimes is important also in demonstrating to skeptics that the techniques, when properly applied, really work. A good example of this is the work which has been done in orientation and mobility in the past ten years. Anyone who has worked under a blindfold knows how reinforcing it is to discover that, but for the use of the hand and forearm technique, one might have broken his nose on an open door.

Applied to training in utilization of low vision, a short-term study institute may include a *brief* background lecture preceded by abstracts (one page limit) of the research, followed by a film or video tape demonstration of the administration of the Visual

Efficiency Measure, and a look at principles and materials used in training programs. The remainder of the time should be used for giving all trainees supervised experience in administration of the measure, scoring, making profiles, and planning a series of lessons based upon the profile. If practical, the institute should also include a session in which each participant has a chance to teach a portion of the visual stimulation program based upon the profile. Finally, plans should be made *during the institute* for evaluation of its effectiveness in terms of the behavioral objectives. Remember: The ultimate objective is the increased visual behavior of low vision children, which is also the ultimate measure of the effectiveness of the in-service training program.

DEVELOPMENT OF VISUAL POTENTIAL IN YOUNG CHILDREN

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It is a pleasure to share with you some of our exciting experiences with very young low vision children. This new adventure has been realized because of the guidance and support of our state supervisor, Miss Elinor Long, and the enthusiastic cooperation of the Elwyn Institute Staff and our County Intermediate Unit.

The complete program for developing the use of remaining vision is diagnostic in nature. The first step is evaluation by a Comprehensive Committee for Multihandicapped, an interdisciplinary team of clinical specialists and educators who spend approximately one week evaluating each child. My job is to meet with our ophthalmologist to study the results of his examination. If there is evidence of any remaining vision, I try to assess the child's visual functioning. The parents of the very young child are requested to bring a favorite toy from home, which is helpful in gaining rapport with the child and valuable in gaining some knowledge of his usable vision and developmental language.

Assessing an older child's functional vision is relatively easy since he has had the advantage of school experiences. Dr. Natalie

Barraga's Visual Efficiency Scale and other visual tasks can be used effectively. However, since most three-year-olds have limited visual images and language, it is best to take them to the classroom to observe their visual and tactual behaviors as they explore their new surroundings. It is also helpful to have the parents present so you can get an idea of their feelings toward the impairment and how they view their child.

Together with educators and other representatives from referring agencies, we meet in committee to attempt to determine the direction the child's program should take as based on our observations of the child's present strengths and weaknesses. A few of us meet with the parents to explain the results of evaluations and the preschool program for visual stimulation.

The children are then placed in the classroom for a temporary period of one or two years in order to stimulate the residual vision before making any final decisions for future educational placement. In other words, we view the classroom as an extension of the clinical impressions. Our ophthalmologist continues to see the child in the classroom setting and also reexamines each child every six months. We inform the other committee members of the child's progress and discuss any pertinent problems.

The teachers accept the child as a child. They are more concerned with the *what* of the child than with the *why* and *how*. They are constantly searching and experimenting to learn *what* he can see, under *what* conditions and with *what* materials. The visual stimulation activities are based on the beginning behavioral objectives of Dr. Barraga's program with much emphasis on developmental language. Teachers expect the child to use his eyes and they gear the individual activities so the child can successfully use some vision most of the day. Motivation has not been a problem. Once the child has some training, he is usually self-motivated when he knows he can see.

As we all know, visual stimulation is more than what happens at school. It is vital that parents participate in the program since some of the activities must be reenforced at home. A social worker and I meet with our parent group each month and when the need arises, individual parents visit the classroom to observe the program. Our parents have made many fine suggestions and contributions in the last two years. One father designed a slanted light box which has proved very helpful for motivating rubella children to focus and track representative forms.

After the diagnostic study and enough time devoted to stimulating vision, an appropriate educational placement is recommended. We started our program with six four- and five-year-olds. After one year, two returned to their neighborhood schools with the support of the itinerant teacher and two were placed in our county resource room for visually limited. Two remained at Elwyn in the advanced class and since January have been integrated in the mobile academic classes in preparation for public school this September.

Recently, a group of pediatric ophthalmologists visited our classrooms. They have seen some of these children since birth and were amazed with their present visual performance and highly impressed with the positive change of parent attitude.

Although we have received much fine publicity in the past year, we feel the highest compliments are from the lay and professional visitors who generally comment that "these children don't act like they're visually handicapped." We have all learned much from these children.

THE NEED FOR CURRICULUM PLANNING IN THE FIELD OF LOW VISION

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Experience has shown us that curriculum planning, implementation, parent preparation and in-service training of total staff are necessary each time a new program is introduced into our schools. Training of those involved in the program and supplying the necessary materials for the program are not enough to guarantee success. Commitment to the program with provision for scheduling constitutes a basic step, for scheduled time is a must. The most dedicated staff with a great desire to facilitate a change or initiate a program will find that it just does not happen until time is set aside for it. For administrators, this creates the problem of careful selection of programs with the needs of the students as the first consideration. Each year there are requests to add courses to the

curriculum until there are not enough hours in the week to meet the requests. What can be eliminated? This is a constant problem.

Since total staff involvement is so important to the success of a program, consideration must be given to the number of innovative programs which can be initiated in any one school year. In our eagerness to do everything possible for the youngsters, it is easy to become involved in more changes than we can handle well at one time. Delay may be disappointing, but haste can be disastrous. It is far better to involve those who are convinced that the program is necessary in selling the program to others than to begin a program before you are fully prepared to implement it.

Developing the visual potential of children has high priority, for the special needs of children with low vision or any residual vision have long been recognized and often not too successfully met. The pendulum has swung, in my 40 years in the field, from prohibiting the use of residual vision on the basis that use would be harmful to devising a program for stimulating the use of any residual vision on the basis that such use is not harmful unless a specific condition exists in which instruction would not be appropriate. Thank heavens for change, for it was a real chore to keep a child from using his residual vision if he had found out that he could use it. Some of you may remember the dark study hall rooms, the poorly lighted classrooms, the bibs covering the braille books and the tricks the youngsters tried to overcome these obstacles.

The work of Dr. Natalie Barraga in research which proved the efficacy of a program of intensive, sequential teaching to stimulate and train the utilization of low degrees of remaining vision, the development of a program of instruction by Mrs. Rosemary O'Brien, Mrs. Sylvia Hoffman and Mr. Ronald Howard for Montgomery County, Maryland, Public Schools, and the master teacher institute at the University of Texas have given us the foundation for the development of programs nationwide. The American Printing House for the Blind produced materials for use in a program to stimulate and train the utilization of residual vision.

Federal funds made possible a workshop to train teachers in Maryland in the use of the materials which have been devised. We were fortunate in having Mrs. Rosemary O'Brien as Co-Director of this workshop with Dr. Natalie Barraga and Mrs. Sylvia Hoffman among the consultants. Eleven of the twenty-five participants were from our faculty. Each teacher had the experience of working with a child and seeing the progress which could be made by using the materials

provided. The next step in getting for the children the help which they need is in the hands of administrators of school programs.

At the Maryland School for the Blind, we now have one teacher who attended the Master Teacher Institute in Texas and ten of the eleven who had workshop training in stimulation of residual vision and we have purchased from the American Printing House for the Blind the materials necessary to begin a program. Interest is high, and time will be allotted for beginning our program in the 1972-73 school year with students who are enrolled in our school. A small group of students, identified in 1971, will be scheduled for the initial program. The parents of these children were contacted at the time of the summer program and have some knowledge of the program.

Do we need a specialist in low vision to coordinate the total effort to serve individual children? Such a person would definitely be an asset, but, from a practical point of view, it may not be possible to add a person to the staff. In this situation, a person on the staff may be able to gain expertise and serve as coordinator. In our case, the curriculum coordinator is qualified to coordinate the low vision program in conjunction with his work on the total curriculum. The mobility staff has already expressed a desire to do more intensive work with the physical education department in working with low vision students. These two departments and skills of daily living and home economics can make a real contribution toward meeting the needs of children with residual vision through careful planning, implementation and cooperation with the classroom teachers, parents and dormitory staff and working closely with the optical aids clinic.

The health service staff is constantly collecting data on the students which is helpful to all who work with them. Annual ophthalmological examination reports with recommendations for those who should be seen in the low vision clinic help identify new students or students with changing vision who should be screened for the vision stimulation program. I would expect that very few of the children will have had an opportunity for pre-school work in vision stimulation.

Guidance counselors, psychologists and psychiatrists might well become involved in the low vision program as it relates to students, staff members and parents and their attitudes and adjustments to changes. They would be valuable indeed as participants in an

in-service training program.

In-service training programs for total staff are becoming increasingly important in our changing schools. The coordinator of cottage family life supervisors would play a vital role in planning these programs and making them meaningful for his staff. The president of the P.T.A. and of the Mothers' Club or their representatives would necessarily be involved in facilitating work with parents. Classroom teachers trained to follow through on all phases of low vision stimulation can reinforce the work of the specialists.

Optical aids, illuminating devices and magnifying devices are available, but some of them are quite expensive. It is necessary to experiment with such devices and determine which ones are most useful before investing in them. In our experiments, we have found very versatile the Visualtek Read/Write Systems, a closed-circuit television aid which magnifies an image up to forty times and improves the contrast. Reversed displays (white on black) reduce glare and prove much easier for some students to see. Our students reacted well to this aid. Hi intensity lamps have given some students the illumination they need right on the work which they are doing, and a variety of small magnifiers have helped other students.

Nationwide curriculum planning in the field of low vision will make it possible for children with some residual vision to benefit from the research which was done by Dr. Barraga, the program of instruction which was so carefully devised by Mrs. O'Brien, Mrs. Hoffman, Mr. Howard and implemented by Montgomery County itinerant teachers, the materials which are available through the American Printing House for the Blind and the expertise gained by teachers in workshops. We know the needs of the children. We know we have not met the needs adequately in the past. We know that some children have learned how to use their residual vision through a sequential curriculum to train the effective use of low degrees of remaining vision. We know that to children with severe visual impairment, even a little gain in visual efficiency is valuable. Let us make our goal a nationwide effort to include stimulation of residual vision in our curriculums.

EDUCATIONALLY SIGNIFICANT VISUAL ASSESSMENT

IN YOUNG CHILDREN

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When a partially sighted child is being evaluated for an educational program, the ophthalmologist consulted assigns a set of medically meaningful values and expectations for that child's visual abilities. It is the purpose of this paper to translate these values and expectations into educationally significant assessments. The partially sighted child is defined for educational purposes as including distance visual ranges in the best eye or in both eyes together of from 20/200 to approximately 2/200 acuity.

Visual acuity is a measure of the smallest retinal formed image which can be distinguished by the human eye. It is the combination of the "minimum visible" or light sense stimulus and the "minimum separable" or form sense stimulus. Standardized optotypes or symbols subtend upon the retina an angle of 5 minutes of arc at any given distance. The smallest distinguished subdivision of the form is one minute of arc[1]. The numerator of the acuity measurement is the test distance and the denominator denotes the smallest symbol size seen at that distance. This value is influenced by the judgment and experience of the observer, the region of the retina stimulated, the intensity and distribution of the illumination, the spectral nature of the light, the time of exposure, the effect of the movement of the object and whether the test is performed on each eye singly or both eyes together[2].

The macular area develops the highest acuity in well illuminated situations while the peripheral or extra-macular retina is the most efficient in reduced illumination. The spectral feature of the illumination affects the acuity. Less acuity is recorded in the violet range of the spectrum while greater acuities are noted for

the longer wave lengths. Greater acuity is obtained with short observation time versus continued observation or staring. Movement of the object or of the head or eyes reduces the acuity in proportion to the speed of the movement. Increasing the luminence levels provides an increase in the visual acuity. In children with nystagmus or head bobbing, increased room light may improve visual function. The distribution of the illumination affects acuity. An increase in the contrast between object of regard and its background increases visual acuity. Teachers should consider this factor when presenting written material to the student in the form of blackboard lettering and duplicated material[2].

The ophthalmologist and educator often examine partially sighted children with congenital or acquired neonatal defects who have not learned to utilize the residual vision present. These children have been raised as "non-seeing" individuals and have no concept of forms, figures, colors, letters, etc. Instead of revealing their ignorance, they often feign an inability to see and score less on visual testing than they deserve. This oversight has been recognized and educational measures are being provided in the form of neonatal stimulation, pre-school and school educational programs[3].

The measurement of the visual acuity alone does not reveal the patient's total visual dysfunction. Other physiologic and pathologic parameters plus the inter-relationships between a child and his parents, teachers and physicians over a prolonged period establish a value of what the visual limits may be. When maximum visual stimulation has been achieved, an acuity value under optimum conditions may be established for each patient which reflects full visual potential. The child may then be placed in an educational situation that duplicates or falls within the upper limits of his ability. For example, a child with 20/200 visual acuity who sits 20 feet from the blackboard in the classroom would require a teacher to print letters 3½ inches tall (20/200 designation). An additional variation in any of the above mentioned factors which affect acuity would reduce the letter size to below acceptable ranges for this child. Therefore, larger letter sizes or closer placement to the blackboard would be recommended for this student. This same notation may be utilized by the mobility instructor for greater distances. The size of the symbol doubles with the doubling of the distance. The 3½ inch letter at 20 feet (20/200) requires a 7 inch letter at 40 feet, a 14 inch letter at 80 feet, etc. This information becomes meaningful in distinguishing street signs, transportation signs, etc. which often do not reach the size requirement

for a partially-sighted patient.

Acuities less than the largest common symbol from the Snellen chart are recorded in low vision patients. The largest letter, often 20/200, is brought closer to the patient or the patient may walk toward the chart until he is able to distinguish the symbol. The recording of the distance is the numerator and the denominator denotes the symbol size, i.e.,10/200. Greater accuracy is imparted by reducing the distance of the patient from the standard acuity chart and recording his performance with greater numbers of symbols. This value is converted to the 20 foot designation by multiplying both the numerator and the denominator by the same factors, i.e., 4/50X5/5=20/250. The examiner's fingers subtend approximately the same angle as the 20/200 optotype and may be substituted for the letter notation, such as counts fingers at 3 feet or 3/200[4].

There are additional methods of determining visual acuity in infants, pre-school, illiterate or uncooperative children[5]. Optokinetic nystagmus, pupillary responses, fixation responses and illiterate symbols are included. Of note is the extrapolation of values achieved by determining the fixation ability of the eye. Good, central and maintained fixation indicates acuity in the range of 20/15 to 20/200. Good, central but not maintained fixation ranges from 20/30 to 20/1000 while eccentric or no fixation indicates acuity of 20/200 or 20/1400[6].

Near visual acuity with and without distance correction is always determined in children with low vision. It is essential in patients with peripheral medial opacities, aphakia, nystagmus, paresis of accommodation, irregular and high astigmatism, high hypermetropia, organic amblyopia or other pathological defects where distance vision may not be useful. The near visual acuity and the circumstances surrounding this measurement should be transmitted to the educator. The notation may be recorded as Snellen acuity and is the visual angle at a given distance. Jeager and point print denote type size which can be directly related to educational materials. The distances from the eye at which the acuity is obtained should be included. The illumination upon the written material during the testing is recorded as intense light, direct or indirect, or reduced illumination.

Binocular determination often exceeds uniocular test results even though only one eye is functioning maximally. Patients with eccentric fixation may achieve greater acuity results with single letters than they do with lines of print. The test distances between maxi-

mum achieved acuity versus comfortable reading acuity are often different. The child may achieve a high degree of near vision with great effort at very close ranges with very slow recognition time. With larger print at greater distances, the same child may not achieve as high an acuity determination but he may increase his speed of recognition of letters, words and concepts and obtain more comfort and enjoyment from his reading material.

Reading performances may be variable in visually limited children. The ability to read standard print depends upon the child's intelligence, motivation, counseling, optical correction and educational encouragement. Magnification is obtained by holding the material closer to the eye, by the use of special lens or by large type books. Most children have an ample amount of accommodation in the early years to compensate for excessively close reading distances[6].

Learning disabilities and reduced visual acuity are unrelated as long as the print is visible. However, partially sighted children may co-incidentally have learning disabilities and may need the same remediation techniques as a sighted child[4].

Visual field examination is a continuation of the visual acuity measurement over the whole useful retina. The fields are influenced by the same pathological and physiologic variations as the visual acuity determination. Fields may be divided into central or macular fields and peripheral fields. The child with a central field loss may have excellent traveling or mobility vision but is able to read only large print without magnification. Patients with severe peripheral field loss or constrictions, homonymous heminopsias and inferior altitudinal heminopsia, may have excellent central or reading vision but be unable to travel. However, if the field is less than 10 degrees, the patient may not be able to read comfortably because the field decreases rapidly as print is brought toward the eye. Other patients may have fields limited to segments which project only short distances for them. Mobility depends upon projection and the acuity at that distance. Right homonymous heminopsias without macular sparing, inferior altitudinal and bitemporal heminopsias limit reading ability because the patient can see no words in the field ahead[7].

The room illumination and that upon the object of regard influences visual function in many patients but is variable even in patients with the same disease process. Patients with night blindness are almost totally incapacitated in diminished illumination while patients with day blindness find acuity decreasing with increasing

illumination. Patients with albinism, achromatopsia, aniridia, posterior subcapsular cataracts, corneal opacity, some macular degeneration and others affected by photophobia, often prefer diminished illumination. Patients with colobomas, miotic pupils, glaucoma, healed chorioretinitis, pigmentary degeneration, optic atrophy and high myopia, aphakia and most macular degeneration prefer maximum illumination[7]. Glare is troublesome to most visually limited children. Each patient must select his own best illumination criteria and no rule is absolute.

Color vision testing adds another parameter to the visual assessment[2]. Defects may fall into three general categories and a past history is important in differentiation. Eight percent of boys and 0.4% of girls are hereditarily color defective. Two types exist: the first is dyschromatopsia in which color confusion occurs and the second is achromatopsia in which color discrimination is absent and vision is monochromatic. Color testing in school children is useful to alert kindergarten and early grade teachers to a student's ability to distinguish colors. Emphasis is often placed upon color discrimination in the early grades and penalizing a young child because of an inherited defect only leads to frustration. All color defectives are able to distinguish traffic signals of red and green by intensity, position of lights or by color variations of the lights.

Acquired color defects occur with retinal and/or neural diseases. Generally blue-yellow defects occur with retinal diseases and red-green defects occur with optic nerve diseases. These subdivisions are not inviolate and depend upon the severity of the pathologic involvement. Repeated color testing aids the ophthalmologist in assessing the pathologic progression of some ocular defects and functions as a useful prognostic tool. A third group of color defectives occurs in those patients who have not learned color differentiation. Color education is necessary before color testing is valid.

Other less commonly used but important tests of visual function are the electroretinogram, electroencephalogram, dark adaptation studies, flourescein angiography and neurologic evaluation.

There are many abnormal positions and movements of the head and eyes that disturb teachers, parents, patients and physicians. Abnormal head posture may be due to strabismus, retinal fixation anomalies, nystagmus, refractive errors, orthopedic and central nervous system defects.

Paralytic strabismus produces abnormal head postures to compensate for diminished field of muscle action, or to re-establish binocular vision in a part of the field. Abnormal head postures occur as tilts to the shoulders, depression or elevation of chin and face turns. They may occur singly or in combinations. Since the child may be attempting to achieve greater function by adopting the head posture, efforts should not be made by the educator to rectify this abnormality.

Nystagmus may occur as horizontal, vertical or rotary or in combinations. The ocular movements vary in direction, rapidity and extent and may be pendular, jerky or both and vary in different directions of gaze. It increases with increased visual attention and nervousness and decreases with convergence. A head posture may be adopted to place the eyes in the position of least ocular movement and best visual acuity. Occasionally surgery may be undertaken to move the eyes to a better forward position and relieve the abnormal head posture. Head bobbing or nodding may also occur with nystagmus. Nystagmus patients usually have good near vision, but approximately 20/200 distance vision. Uncommon varieties of nystagmus have poor or good visual acuity at both distance and near and the former type requires special education.

Abnormal head postures may be related to abnormalities of the fixing eye which consist of medial opacities or irregularities, retinal diseases, amblyopia with eccentric fixation and refractive errors.

Children with visual disorders may have defects of other organ systems[4]. Neurologic disease is the most common and consists of seizures, hydrocephalus, microphthalmus, brain dysfunction, mental retardation, cerebral palsy, behavior abnormalities, etc. These children may also have psychological abnormalities related to their poor visual capabilities, poor family and peer relationships or poor self-image. Orthopedic anomalies may hinder mobility and Braille education. Metabolic diseases, particularly diabetes, are associated with peripheral neurologic abnormalities with decreased sensation and decreased ability to read Braille.

The ophthalmologist must establish a working prognosis for long and short term goals. The prognosis is compiled from the patient's own history and physical findings, family occurrences and tendencies and a review of similar cases in the literature. A prognosis is included in all school reports but it must be clarified. The notation of a poor prognosis eliminates attempts by the educator to

impart visual stimulation to that child. Even children with inevitable blindness should have an opportunity to obtain as much visual experience as possible before the visual loss occurs.

All available methods of remediation and rehabilitation including psychological must be pursued. Optical methods utilize corrective spectacle lens, bifocals, low vision aids, telescopic aids, contact lens, etc. These aids give the best possible vision under varying circumstances. Distance or intermediate viewing, telescopic spotting or traveling vision requires one set of visual aids while near vision tasks, occupations, and reading require other types. Tinted lens are useful in photophobic patients. Safety, impact resistant, or plastic lens should be routinely prescribed for all children. Contact lens may be worn by some aphakic and anisometropic children.

Magnification requirements vary with age, range of accommodation and the type of pathology present. Patients with limited central field losses or overall depression of visual function respond beter to magnification than do patients with large central scotomas or extensive peripheral field losses[5]. Many partially sighted individuals with poor distance vision are quite capable of achieving almost normal near acuities without magnification.

Medical treatment of intercurrent diseases may alleviate symptoms or signs of additional visual defects and emphasize the need for periodic re-evaluation of these children. The onset of glaucoma, uveitis, cataract, secondary membrane opacification, detached retinas, etc., may first be suspected by noting decreasing visual activities, ocular irritability and pain in a previously stable and comfortable but visually limited eye. Medication, surgery and optical aids remedy these conditions and may return the eye to its previous level of competence.

Enucleation of blind, painful, irritated or cosmetically disfigured eyes may be indicated in older children who must meet the public and accept job opportunities. Confidence in personal appearance often bolsters the young adult to success where failure and introversion might otherwise intervene.

Genetic counseling is encouraged for parents with children who have hereditarily transmitted defects and for young adults with hereditary defects contemplating marriage. Curtailment of families with inherited defects is strongly advised.

It has been the custom in the past to conserve vision by non-use

of the eyes. Today, the concept of maximum stimulation is seen to be of more value and educational programs are stressing the increased use of residual vision[3].

Recommendations may be made by the physician to the school system for the type of education for which he feels the child is suited. However, the total visual efficiency or visual function of the child cannot be measured numerically. The use of residual vision depends upon motivation, intelligence, personality, the amount of vision correction possible, the type of defect and age of onset, guidance, experience, age, and encouragement by peers, parents and instructors[6]. Observation of the child by the teachers, positive reinforcement for successes in learning and repeated re-evaluation by the physician brings about maximum use of the eyes. Final placement depends upon recommendations from teachers, counselors, parents and ophthalmologists as well as trial and error efforts on the part of the student.

Print size is best determined by the needs and abilities of the child and both regular and large type print may be used interchangably. Large type (18 and 24 point) is indicated when the distance acuities are 2 to 10/200, when 12 point (pica typewriter) cannot be read at 2 inches from the eyes, when greater distances are needed (mathematics and accounting) and when large type provides more comfort for a given patient[7]. The demand for large type books probably exceeds the need. Magnification of the existing print can be achieved by reducing the distance from the eye to the printed material and this produces greater magnification than that of the large type held further from the eye[7]. The disadvantages of large type relate to their general unavailability in higher education and in all subject matters, excessive book size and weight and exaggeration of the difference between the visually limited child and his peers. If the child is unable to read print without fatigue and at adequate speed, records, tapes, readers or Braille may be substituted. Braille is indicated for patients with acuities less than 2/200, an inability to read 18 point print at 1½ inches or the prognosis for future loss of vision is pronounced.

Physical activities are commonly limited in partially sighted children. Normal physical development and energy release is needed to develop bodies and body image. Restriction of contact sports such as football, boxing, diving, etc., is wise in patients with a predisposition to detached retinas. However, routine gym classes conducted for partially sighted children rarely include such sports.

In summary, the information sent to the educator by the ophthalmologist has value in helping to place a partially sighted child in the best educational situation. By cooperation among all those working with visually handicapped children, a proper continuing assessment of significant visual function and therefore, educational successes, may be made.

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